National

SAFETY NEWS

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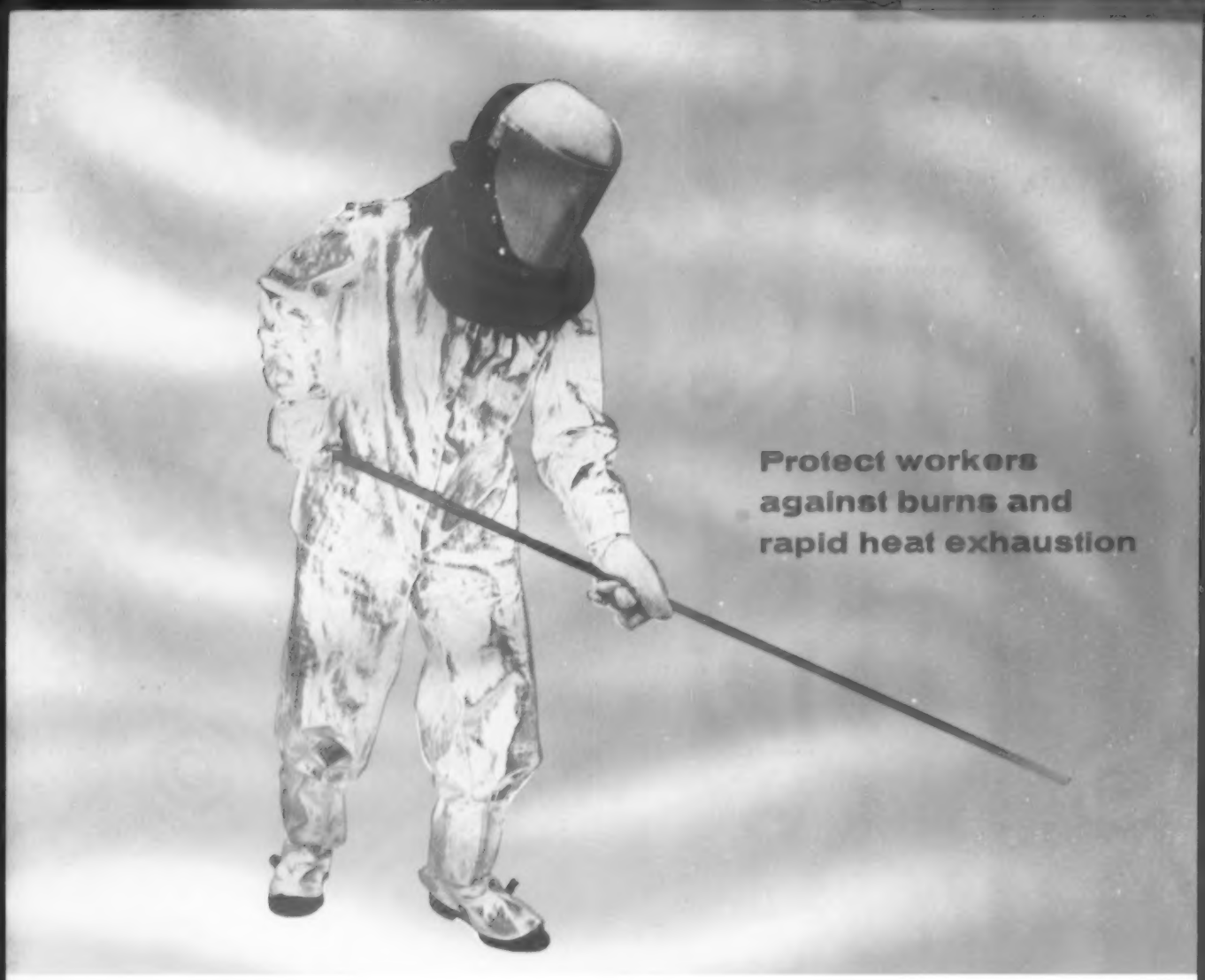

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21st Annual Safety Equipment Issue

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EDITORIAL

Value for Your Safety Dollar

WITH SAFETY EQUIPMENT, as with men's clothes, changes from year to year are not conspicuous. Many items listed in our First Safety Equipment Issue (1937) would still be acceptable. But there has been a steady increase in available products and services.

They are better, too. Modern equipment is lighter, stronger and better looking as research in the laboratory and on the job has pointed to improvements. Developments in plastics and metallurgy have found many applications in safety.

The constantly increasing tempo of industry, the introduction of new and hazardous materials and the harnessing of atomic energy present a continuing challenge to operating men and to manufacturers of safety equipment.

Standards developed through the procedure of the American Standards Association have educated both manufacturers and buyers and cleared away much confusion as to what constitutes adequate protection.

On many products the approval label of such organizations as Underwriters' Laboratories and Factory Mutual Laboratories indicates that the product meets accepted standards of design and has passed exacting tests. Some trade associations have also developed safety standards for their own fields.

But the reputation of the manufacturer is still an invaluable guarantee of satisfaction.

* * *

And speaking of improvements, an important one has been made in this issue. The type is larger than in past equipment issues, which should be as welcome to readers as it was to the editors and proofreaders.

The Equipment Issue is a reference work, concisely written to include as much basic material as possible. More detailed information will be found in publications listed in the bibliographies in each section.

Unfortunately, it has not been possible to list all sources of information. Much valuable material will be found in trade publications serving industry in general and those dealing with particular industries and trades.

And in your search for safety knowledge, don't overlook catalogs. Many of them contain useful data as well as descriptions of products and prices. They're interesting, too.

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(Fiction)

THE DIARY OF A SAFETY ENGINEER

Planning and building a new plant and getting it staffed and operating leads to complicated and far-reaching problems —and overcoming reactionary ideas

Around the Table

By BILL ANDREWS

March 1, 1957

The visitors had been taken on a tour of the Lovellburg property. Engineers and architects had pointed out locations, developments, street lines, and so on.

Finally, with mud on their shoes and faces red from the raw wind, they came back to the little conference room at the McCarthy Products plant, the only unit in what is to become Lovellburg which is in operation or even built.

On my side of the long table were the project construction engineer, the head field man of the architectural firm, the manager of McCarthy Products, the project personnel manager, and our local comptroller.

Across from us sat the outsiders—a Chicago banker, two poker-faced bigwigs from Eastern Enterprises' Boston headquarters, a United States senator, a well-known public relations consultant, and a professor of sociology from Harvard.

The chairman was Lewis Bradalli, managing director of Lovellburg, the big wheel in the whole project.

Under Bradalli's prompting, the local technical staff laid out the broad plan to the visitors, using charts and slides and graphs to supplement their explanations. It was an excellent presentation. The Chicago banker broke in repeatedly with incisive questions.

The comptroller took over next, developing the financial aspects of materials, payroll, and other outlays.

The McCarthy manager outlined the history of his firm's development and experience in the area.

Then the personnel man talked —and here it was the senator and the sociologist who seemed most attentive—about the labor supply in the rural region around us and in Greentown, 10 miles away. He encountered a storm of questions dealing with the disruption of the community and the radical remaking of its way of life. He had his facts and countered with a convincing case that the radical reorganization of community life was the only alternative to the gradual economic decay of the region.

* * *

Finally it was my turn. This is what I said:

"Ordinarily, a safety man comes into a company which is in full operation. It has a good, bad or indifferent safety program in operation. He assesses the situation, accepts the limitations imposed by existing facilities and old prejudices, and seeks to insinuate improvements into a human mechanism of great complexity without slowing down its operations.

"He can, if he is able, accomplish a great deal. Yet he is constantly hampered, constantly slowed down, by the strength of the existing limitations. In effect, he is asked to do on a plant-wide scale exactly what he is constantly telling the worker on the job not to do—he is trying to adjust the machinery while it is in operation. It is an occupationally dangerous practice.

"I've been given a much happier assignment here. I've been called in early—not quite at the beginning—but early enough in the planning stage to accomplish, I hope, a great deal in the way of minimizing the physical, built-in hazards of this industrial complex.

"More than that, I am on the spot to plan, from before the start of operations, a comprehensive program of integrating safety training into the general program of employee training.

"I am already at work with the purchasing office on a program of planned procurement of safety equipment, which will avoid, I hope, any hit-or-miss experimentation or improvisation.

"Finally, I am already working with McCarthy Products to set up a model safety program to set the tone for the whole area."

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THE PURCHASING TEAM

1. The Safety Engineer

By REX C. BECKSTEAD

THE safety engineer can best benefit the safety program by developing his own stature to such a degree that his function in purchasing safety equipment will be respected by plant management and employees. To develop necessary background, each plant hazard must be studied and evaluated with regard to safety equipment requirements. An honest effort must be made to gain respect of workmen, foremen and the purchasing department by gathering ideas and giving careful consideration to the problems of each.

Before making recommendations, the safety engineer must gather the facts. Many faulty decisions in purchasing safety equipment result from incorrect preliminary investigation. A careful set of control tests in connection with each piece of equipment should be set up by the safety department and used to determine purchasing standards.

With this on-the-job testing program laboratory-controlled tests should be used. If the plant is small and laboratory facilities cannot be set up, information can be gathered from outside agencies.

One Test Not Enough

But it is not enough to test products once and think the job completed. A continual study of new safety products is important to keep the plant safety program making satisfactory progress and to give employees maximum personal protection.

Safety equipment usually is broken down into these categories of protection:

Eye and face
Respiratory
Foot and leg
Head
Hand and arm
Body.

In determining equipment for each job, the divisions of protective equipment should be studied separately.

Eye Protection

First, we'll consider eye protection. First-aid records should be reviewed carefully to determine accidents reported and how each occurred. Careful study should be made of work hazards—position of workmen, materials, light reflection, intensity and duration of exposure to harmful rays, dust conditions and other sources of irritation or injury to eyes.

With facts gathered from this type survey, equipment standards for eye and face protection should be established. Best results will be obtained if a safety glass prescription program can be adopted at the same time eye and face protection is recommended.

When considering respiratory protection the job hazard first must be determined. After completing the hazard survey, recommendations of the Bureau of Mines and state health departments will be helpful to the safety engineer in selecting protection for each job.

In our company, through cooperation of the hygiene department, we conduct our own surveys and have set up a testing laboratory for all types of respiratory protective equipment. Standards for this type protection are set jointly by the medical, hygiene, and safety departments and must be followed by all plants. Similar studies should be conducted for foot, leg, head, body and hand protection.

Our safety department has made studies of such items as ladders, chain and cable slings, safety belts, hand tools and welding equipment. Standards for this equipment have been prescribed by the engineering department and are used as purchasing guides.

After proper testing and study, the safety department should go one step further; it should set up proper controls for issuing and maintaining all types of personal protective equipment since acceptance by workmen of equipment will depend largely on this program.

Establishing Standards

In the American Smelting and Refining Company, a great deal of work and study is devoted to personal protective equipment. Standards have been established and are used by all our units throughout the United States, Canada and Mexico. We call it an "engineered safety equipment program," from which considerable savings have resulted.

Each piece of safety equipment is studied and tested carefully for application. If no advantages over present equipment are evident, bulletins are sent individual

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REX C. BECKSTEAD is Director, Safety and Technical Employment, American Smelting and Refining Company, Salt Lake City, Utah. This article is condensed from an address at the session, "Purchasing for Safety," 44th National Safety Congress, Chicago, October 1956.

THE PURCHASING TEAM

2. The Purchasing Agent

By G. H. REINIER

THE purchasing agent's responsibilities in the industrial organization are well defined. Many of them are tied in directly with safety:

1. Cooperate fully with the safety engineer and others who help determine working conditions.

2. Know the nature, causes, and areas of accidents in his company.

3. Inform the safety engineer of hazardous materials and equipment and help in writing their specifications.

4. Select qualified, reliable suppliers.

5. In purchase orders, describe fully all hazardous materials and provide for applicable warranties.

6. Subordinate price considerations if hazards in handling or using the material will exist.

These precepts are more than responsibilities; they are obligations.

Let's examine how each of them may become a day-to-day part of the buying job.

First: *Cooperation.* Without willing cooperation—the kind we are willing to give because we know our value on the job increases because of it—no one of the other five responsibilities we lay at the feet of the purchasing agent can be discharged fully. If we are to have the purchasing man show this important attitude toward safety, we must give it fertile soil in which to develop. Only the safety engineer can engender this consciousness in the purchasing man and keep it alive.

Second responsibility: *To have a knowledge of what causes accidents.* Most of this information will come to the purchasing agent in reports from the safety engineer. A visit to the scene of an accident and a check of the questionable machine or material will make this data more meaningful. Inviting the safety engineer to sit in on purchasing-staff discussions involving safety problems is also helpful. Through these department-wide sessions, a uniform program of "purchasing-for-safety" can easily be inaugurated.

In our company, for example, several office workers caught fingers in a desk drawer of unusual design. A department manager broke a finger in it.

If the safety engineer does not inform purchasing of this "defect," the manufacturer is entirely unaware of the existing hazard and never changes or improves the design.

Keep Others Informed

Third responsibility: *Transmission of data on hazards.* A good purchasing agent will receive from suppliers thorough information on hazardous materials. Merely passing on this data to the safety engineer may not be enough. In some organizations the plant physician or nurse, the department manager of the using department, the engineering department, or the personnel department may have an interest. Or it may be that a safety committee, plant security committee, product development or research group is involved.

Whatever the needs, the purchasing agent is obligated to notify all who are interested. The safety engineer generally will handle most of this. The buyer can be helpful by supplying multiple copies of data to the safety engineer, thus reducing time and work in his office in passing along information.

Ingredients and Design

The safety-minded purchasing agent always will discuss with the supplier aspects of handling new materials. He will investigate and evaluate engineering talent of his equipment suppliers so he can obtain machinery with accidents "designed out" of them.

He will realize that in this day of allergies, some materials from which work clothing, tools and packages are made might cause skin or respiratory allergies. For this reason the purchasing agent who follows the safe course will have suppliers enumerate the ingredients of materials he buys. He will have this data checked by safety men and technicians before introducing a new material.

An example of how *not* to do it was demonstrated by the buyer who was offered a job lot of rubber gloves for laboratory workers. They passed visual inspection and were priced remarkably low. It was not until the workers used them that it was learned that most wearers, on exposure, developed a rash. The buyer, of course, was stuck with his bargain!

An intelligent safety engineer will ask purchasing to assist in writing specifications. The purchasing agent knows the language of buying. He often knows what interpretation the seller will place on words or details of the descrip-

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G. H. REINIER is Director of Purchases, Abbott Laboratories, North Chicago, Ill. This article has been condensed from an address at the session, "Purchasing for Safety," 44th National Safety Congress, Chicago, October 1956.

Friendly counsel in the employment office and on the job helps to win acceptance of safe work practices — even wearing safe working clothes

By ELLEN M. McAINSH

Counseling Women Employees

THOUGH self-preservation is instinctive and personal physical safety usually a predominant instinct in an emergency, it's astounding that most of us really believe that an accident is something that happens to someone else.

Along the same lines, the average woman doesn't always realize or appreciate that she's a *whole* woman—that she has all her fingers and toes, that her head and hair are intact, that she's in perfect health. She takes these blessings for granted.

In *Silas Marner,* George Eliot says: "The sense of security springs more frequently from habit than from conviction." The lapse of time during which a given event has not happened is, in this logic of habit, constantly alleged as a reason why the event should never happen, even when that time lapse is precisely the added condition that makes the event imminent. A man will tell you he has worked in a mine 40 years without accident, and offer this as a reason why he should apprehend no danger.

Under that setup, the problem is to fix certain guiding principles in woman's mind. You cannot merely say, "Be careful;" that conveys nothing to her. You cannot put up subjective posters and expect her to be interested or to interpret them herself. Somewhere there's a need that relates to her understanding of the threats to her as a whole woman. For example, if she has good eyes she herself has to understand why anything that will impair her eyesight—such as flying material, walking in the dark or reading in poor light—must be avoided.

The increase of mechanized production and division of labor allow women to work at jobs that formerly required skilled craftsmen. Women are highly adaptable to work requiring dexterity.

The Women's Bureau of the United States Department of Labor reported in 1953 an increase since World War II in the number of women workers, practically all of it a result of married women entering the labor force.

Throughout the postwar period there has been no great change in the number of unmarried women workers — which stands at about 5½ million. Neither has there been any notable increase of widowed or divorced women workers, of whom there are about 2.9 million. The number of married women workers, however, has grown from 7.5 million in 1947 to 10.4 million in April 1952.

From 1947-51, 650,000 married women were added yearly to the labor force. Some 2 million married women more than the World War II peak were working in April 1952. Today, 21 million women workers—more than half of them married—are producing goods and services in the U. S.

The Women's Bureau has noted another significant trend in employment of married women. That is the tendency during the last decade of women to return to work or take jobs for the first time after reaching middle age. Before World War II it was largely young wives in their 20's or early 30's who went into outside employment. More than 5 million women workers have teen-age children, and more than

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MRS. ELLEN M. MCAINSH is Counselor for Women's Safety, American Mutual Liability Insurance Company, White Plains, N. Y. This article has been condensed from a paper presented April 18, 1956, at the 26th Annual Safety Convention of the Greater New York Safety Council.

Many a good safety record came to an abrupt end when somebody slipped or tripped. Where falls are concerned, no job is nonhazardous

Falls Kill and Cripple

FALLS kill about 55 persons a day, with every industry—even the safest—contributing to a total of more than 19,000 a year.

Because of their great importance in the total accident picture, the National Safety Council has singled out falls for special emphasis in an intensive, year-long campaign. Begun last September, the drive seeks a 50 per cent reduction in injuries and deaths from this cause.

Falls are especially significant to industry for several reasons:

—They account for more accidental deaths than any other cause, with the exception of traffic accidents.

—Falls take a heavy toll of workers, ranking just after handling objects as the greatest source of disabling work injuries.

—Falls are costly. Tumbles from different levels frequently result in death or serious injury and compensation payments are substantially above those for other accidents.

—Falls account for more than half the injuries to office workers.

The Council's National Campaign for the Prevention of Falls is picking up steam. Throughout the country both management and labor are promoting the program. Companies are publicizing it in employee publications, with posters and displays and through special-emphasis slogan contests. Some firms stress a certain aspect of falls each month, including such items as ladder safety, clean floors, clear aisles and corridors. Others are holding special training classes on falls.

Hotels, stores, and restaurants are conducting employee and customer falls safety campaigns. A Newark department store recently devoted a window display to falling hazards.

The AFL-CIO, in a letter from President George Meany to local unions, has endorsed the campaign. The United Rubber Workers and other union organizations also are promoting the drive against falls.

The National Safety Council has made available a series of banners, posters, films, safetygraphs, illustrated booklets, clip sheets for editors, five-minute safety talks, and instruction cards—all on falls. Any industrial, commercial, public service, mining, or other employer organization may enroll; the campaign is not limited to Council members. Information and a brochure listing materials are available.

Certificates of achievement will be awarded each plant showing a 50 per cent reduction in falls or having no chargeable injuries from falls during the campaign year.

In industry falls occur in many places and from many causes. They are generally classified as:

1. Falls on level surfaces.
2. Falls from one level to another.

One survey showed that of every 100 falls of persons:

—31 occur on level surfaces.

—15 involve use of ladders.

—12 take place on stairways.

—11 on or from scaffolds.

—6 into openings of various kinds.

—25 from miscellaneous causes.

Conditions and practices causing most falls include:

Structural Hazards

—Floors—uneven, in poor condition, excessively smooth.

—Stairs with worn or broken treads, irregular or curving treads.

—Floor openings—unguarded or with loose coverings.

—Scaffolds and platforms with loose or defective planks.

—Ladders with defective rungs, rails or steps.

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Fatalities Creep Up in 1956

Increased employment and motor-vehicle mileage boost totals. Home death total down 500. Farm death total down 100.

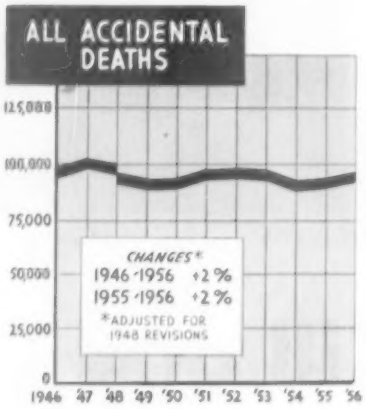
THERE were approximately 14,300 deaths from work accidents in 1956, or 100 more than in 1955. Increases were recorded in 2 of the 8 principal industrial groups; a decrease in 1.

The death total for service industries (including finance and government) was 2,400, or 100 more than in 1955. Contract construction industry fatalities numbered 2,600, an increase of 100 from 1955. In agriculture, deaths decreased 100—from 3,700 to 3,600. For the other industrial groups the 1956 death totals were the same as in 1955: Manufacturing 2,000; public utilities 200; transportation 1,300; trade 1,400; mining, quarrying, oil and gas wells 800.

Nonfatal injuries totaled approximately 2,000,000, compared to 1,950,000 in 1955. Permanent impairment cases numbered about 80,000.

Employment in all industries during 1956 was about 3 per cent more than in 1955. In manufacturing alone, employment increased 2 per cent.

Accident rates cannot be computed at this time on a national basis. Preliminary information indicates that the all-industry frequency rate probably was about the same as in 1955. Nonfatal injuries, as noted above, increased



about 3 per cent. Employment was up 3 per cent and average hours worked per week were unchanged, resulting in a total increase of approximately 3 per cent in exposure.

Accident Costs. Wage loss, medical expense, and the overhead costs of insurance for work accidents in 1956 amounted to about $1,900,000,000. The so-called "indirect" costs are estimated at $1,700,000,000. These include such items as time lost by workers other than the injured, time lost by workers whose injuries were not serious enough to be classified as temporary total disabilities, interference with production schedules, and property damage. Total costs thus were about $3,600,000,000.

Off-The-Job Accidents. In addition to the work accidents, the nation's productive capacity was lowered by off-the-job accidents of workers. The 1956 death toll from these accidents was approximately 30,800 and the injury total about 2,350,000. Accidents to workers, on and off the job, thus totaled 45,100 deaths and 4,350,000 injuries. The time lost during the year from these accidents, and from less serious injuries and indirect losses, amounted to approximately 295,000,000 man-days.

Fire Loss. The 1956 total of property destroyed by fire was $989,000,000, according to the National Board of Fire Underwriters. This was 12 per cent more than the comparable 1955 total. In 1955 nearly half of the loss from building fires was in industrial and business establishments.

Industrial Commission Records. Deaths reported to Industrial Commissions in 22 states during 1956 totaled 6,781, or about the same number as were reported in 1955. Increases of 1 to 37 per cent were recorded in 13 states, decreases of 3 to 21 per cent occurred in seven states.

	1956	1955	Per Cent Change
Totals for 22 states	6,781	6,788	0
Alabama	96	107	—10
Arizona	72	66	+ 9
California (11 mos.)	924	957	— 3
Connecticut	57	66	—14
Florida	217	158	+37
Georgia	169	168	+ 1
Idaho	84	80	+ 5
Illinois (11 mos.)	237	237	0
Kentucky	87	65	+34
Massachusetts	631	569	+11
Missouri	91	100	— 9
Nebraska	70	89	—21
New York	1,523	1,683	—10
North Carolina	117	121	— 3
Oregon	147	141	+ 4
Pennsylvania	744	725	+ 3
South Carolina	84	82	+ 2
Texas	629	594	+ 6
Virginia	222	222	0
Washington (11 mos.)	223	217	+ 3
West Virginia (10 mos.)	247	234	+ 6
Wisconsin (11 mos.)	110	107	+ 3

THE NATIONAL ACCIDENT FATALITY TOLL

	1956	1955	% Change
All Accidents	95,000	93,443	+2
Motor-Vehicle	40,000	38,426	+4
Public Non-Motor Vehicle	16,500	16,000	+3
Home	27,500	28,000	—2
Work	14,300	14,200	+1

Note: The motor-vehicle totals include some deaths also included in work and home totals. This duplication amounted to about 3,300 deaths in 1955 and 1956. The 1955 all-accident and motor-vehicle death totals are the official figures of National Office of Vital Statistics; all others, National Safety Council estimates.

RESPIRATORY PROTECTIVE EQUIPMENT

Published by National Safety Council
425 North Michigan Avenue, Chicago 11

General

1. Safety equipment can be obtained that will provide respiratory protection against most of the conditions which are likely to develop in industry. Such equipment may be required in the performance of routine jobs when it is not practical to provide ventilation. Equipment must be regarded as essential in emergencies, when the condition or atmosphere is unknown, and when enough ventilation cannot be provided. When planning work, the objective should be to engineer the job so that the air contaminant will remain confined and thus be only a potential air contaminant, or so that it will be removed from the area of generation without getting into the breathing zone of any worker. Otherwise, protective equipment will be needed.

2. It is natural that people dislike inconvenience. It is not surprising, therefore, that some workers will resist the inconvenience of wearing respiratory equipment in a non-emergency situation, even if they are quite sure that the equipment is provided for their protection and that if they do not wear it their health will suffer. In such cases, control will be more effective if it is automatic and not subject to the action of the person being protected, particularly when it is not immediately uncomfortable to be exposed.

3. It is less likely that there will be failure to use respiratory equipment designed for situations that are immediately uncomfortable or where there is an obvious immediate threat to life. There is, however, the occasional individual who wants to carry on a tough tradition, even in situations that are obviously dangerous. Such a one has to be both educated and supervised to assure his use of the equipment provided.

This Data Sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable procedure is necessarily included. Data Sheets should not be confused with American Standard Safety Codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

4. Men who are expected to use respiratory equipment, including those in an area where an emergency would require protection of respiratory equipment, should be carefully instructed in its proper use and the reasons for using it. The training should be especially careful and persistent if the equipment is to be used under emergency conditions. It will be used correctly only if the training has been such that the proper procedure is automatic and does not depend upon conscious thought.

Air-Supplied Suits

5. The most extreme condition requiring use of respiratory protective equipment is that in which rescue work or emergency repair work must be done where there is exposure to substances that are irritating or corrosive to the skin and mucous membranes and are also acutely toxic or immediately hazardous to life. Such a condition may be due to the escape of toxic and corrosive gases or to fire. In either case, a complete suit of protective clothing plus breathing apparatus must be used. For corrosive conditions, the suits must be impervious to the material encountered.

6. There are no generally accepted specifications for such suits, so considerable dependence must be placed upon the judgment of the manufacturer in making them appropriate for the service. When the suit is for use in corrosive atmospheres, it will be provided with a supplied-air hose mask or a self-contained breathing apparatus. In the event a supplied-air hose line is provided, it should have a connection to the body of the suit as well as to the breathing apparatus since the wearing of an impervious suit for any extended period is extremely fatiguing and dangerous unless it is well ventilated.

7. For use under fire conditions, the clothing should be both insulating and reflective so that it will not be excessively heated by the radiant energy from flames. This is accomplished by using various combinations of wool, asbestos, aluminized cloth, and glass fiber with a synthetic rubber vapor barrier. It should be sufficiently resistant to water so that it can be worn under a hose stream (for cooling) without being soaked through. Because of the danger to a hose line from

fire, such suits should be supplied with self-contained air breathing apparatus. Oxygen-supplied or self-generating oxygen apparatus is dangerous under fire conditions because of the possibility of producing an oxygen enriched atmosphere inside the suit.

Hose Masks

8. Where the atmosphere is immediately dangerous to life and conditions permit it to be used, the most desirable form of respiratory protective equipment is a supplied-air hose mask. This is defined as an apparatus having a large inside-diameter hose for connection to a supply of fresh air from an uncontaminated source, and provided with inhalation and exhalation valves. Hose masks with hand-operated blowers are approved by the U. S. Bureau of Mines for use in any atmosphere provided respirable air is supplied through not more than 150 feet of hose. Hose masks without blowers are approved by the U. S. Bureau of Mines if used with not more than 75 feet of hose and in atmospheres not immediately hazardous to life. They are not approved in any situation where the inhalation resistance exceeds 2.5 inches of water or where the exhalation resistance exceeds 1 inch of water.

9. Most blowers for hose masks are supplied with double outlets so they can accommodate two masks with 150 feet of hose each. They may have auxiliary power, but must be immediately operable by hand in case of power failure.

10. When a hose mask is used, a helper always should be assigned with no duties other than to observe the man in the hazardous atmosphere, attend to the life line, and in an emergency operate the blower. A blower operator also should be provided.

11. A body harness is required to handle the hose line of the hose mask and the life line which always should be worn as a rescue device. The minimum requirement for such harness is that it should stand a pull of at least 250

FIGURE 1. Hose mask packed in blower case. (Courtesy Acme Protection Equipment Co.)

pounds. The harness should receive a visual inspection prior to each wearing to detect signs of excessive wear, deterioration due to weathering, or corrosion. No parts which are to go back into service should ever be tested by pulling, however. Equivalent equipment should be tested by pulling and then be discarded. Any part of the harness which is in a condition materially reducing its strength should be replaced without delay.

Self-Contained Breathing Apparatus

12. Under conditions which are immediately hazardous to life and

FIGURE 2. Oxygen cylinder rebreathing apparatus. (Courtesy Mine Safety Appliances Co.)

which require going farther than 150 feet from a source of respirable air, a self-contained breathing apparatus is required. The kind giving the greatest freedom of movement (in the sense that it permits the longest stay in the hazardous atmosphere) is the rebreathing variety. There are three general types using the rebreathing principle, the oxygen cylinder type, the self-generating type, and the demand type.

13. The oxygen cylinder rebreathing apparatus is provided for either one-hour or two-hour duration. The one-hour type is approved by the U. S. Bureau of Mines only when a mouthpiece and nose clip are used. The two-hour type is approved with either a full facepiece or a mouthpiece and nose clip. Such equipment consists essentially of a high-pressure oxygen cylinder with a suitable shut-off and by-pass valve, a reducing valve and a lung-governed admission valve which supplies oxygen from the cylinder only during inhalation, a carbon-dioxide scrubber and cooler, and a reservoir breathing bag connected by tubes to the mouthpiece or facepiece. Check valves direct the flow through the circuit so that the exhaled oxygen is purified of carbon dioxide and rebreathed from the bag with replenishment from the cylinder as required. Such equipment is more complicated to use and maintain, and therefore requires more training than is the case with other types. Neverthless, it permits the longest stay in hazardous atmospheres.

14. The self-generating apparatus uses a chemical canister which evolves oxygen (by reaction with the moisture in the breath) for breathing and which removes exhaled carbon dioxide. It is a rebreathing circuit with breathing bag which acts as a reservoir and facepiece and tubes with check valves for proper flow. It is light in weight, contains no working parts, and provides 45 minutes of service life.

15. Although a demand-type breathing apparatus is relatively

FIGURE 3. Self-generating oxygen apparatus. (Courtesy Mine Safety Appliances Co.)

heavier, it is simpler to use than the oxygen cylinder rebreathing type. It uses a high-pressure air or oxygen cylinder with shut-off valve to which is connected (by a high-pressure hose) a demand valve. This demand valve regulates the high pressure from the cylinder to proper breathing pressure and delivers flow automatically during inhalation only. Exhalation is effected through valves in the facepiece. The fact that exhalation passes to the atmosphere and is not rebreathed makes the demand-type breathing apparatus less efficient and thus it is approved for only 30-minute use. Except as a matter of convenience in refilling cylinders, it makes no difference whether air or oxygen is used. Cylinders once filled with compressed air should not be refilled with oxygen because of the possibility of explosion when oxygen comes in contact with even traces of oil or grease. The U. S. Bureau of Mines approves both air and oxygen demand-type apparatus. Since this apparatus is not under positive pressure, as is the rebreathing type, the facepiece fit is more important to avoid inward leakage.

16. One of the types of self-contained breathing apparatus or supplied-air hose masks thus far discussed should be used for any work that involves entering of tanks or pits where there may be a dangerous concentration of dust, mist, vapor, or gas, or an inadequate supply of oxygen. An inadequate amount of oxygen should be suspected in an iron or steel tank unless a definite test has shown that the supply is sufficient to support life. The rusting of the walls of an otherwise clean tank may dangerously deplete the oxygen supply.

17. An inadequate supply of oxygen should also be suspected in any pit or manhole which has a narrow opening, and in any tank which has held organic materials such as grain or grain products, any type of oil, or any food substance. Such materials as these and many others may gradually react with the air upon long standing to reduce their oxygen content and to produce carbon dioxide.

Air-Line Respirators

18. For most industrial purposes, where there is no danger of acute poisoning but where the atmosphere is dangerous after long exposure, the air-line respirator, either continuous flow or demand type, provides adequate respiratory protection. It differs from the hose mask mainly in having a small-diameter compressed-air hose and a connector

FIGURE 5. Demand-type air-line respirator. (Courtesy Scott Aviation Corp.)

FIGURE 4. Demand-type self-contained apparatus. (Courtesy Scott Aviation Corp.)

for fastening into the plant air or onto a large cylinder of oxygen or air rather than a large-diameter hose supplied from a low-pressure blower. The apparatus for an air-line respirator also contains a flow-limiting device which will permit air flows only in the range of about 2 to 20 cubic feet per minute. At least 2 cubic feet of air per minute flows to the facepiece with the air-regulating valve closed and with a minimum of air pressure in the maximum length of air supply hose.

19. It is necessary that a trap and filter be installed in the compressed air line to separate oil, water, scale, or other extraneous matter from the air stream before it comes to the regulator or mask. If the air supply is in excess of 25 pounds per square inch, an air-pressure regulator is required and, in addition, a pressure relief valve which will operate if the regulator fails.

20. To obtain clean air, the compressor intake must be kept away from all sources of contamination, including the engine exhaust where the compressor is driven by an internal combustion engine. If an internally lubricated compressor is used, it should be well maintained and must not be run too hot, as dangerous amounts of carbon monoxide can be produced in the compressed air by an overheated compressor. To safeguard against the hazard of carbon monoxide being in the

FIGURE 6. Air-line hood. (Courtesy Chicago Eye Shield Co.)

compressed air, the compressor should be equipped with a temperature-actuated alarm or carbon-monoxide alarms should be installed in the compressed air lines.

21. Blowers which do not use internal lubricants and which deliver the air at about 20 pounds per square inch, gauge pressure, are preferable to the conventional high-pressure compressors as sources of respirable air.

22. The air, as delivered to the mask, should be of comfortable temperature and humidity. The heat of compression and the cooling of expansion is often sufficient to produce a temperature and relative humidity widely different from that of air entering the compressor. Provision should be made for automatically conditioning that part of the supply going to the respirator with respect to temperature and water content, as well as with respect to pressure.

Air-Line Hoods

23. Air-line hoods are essentially air-line respirators in which the air is supplied to a hood covering the whole head, and sometimes the torso, rather than to a facepiece. The air is supplied at such a rate that the continuous overflow through controlled openings prevents the entry of any contaminant. They are desirable where the head and face should be protected from flying particles —as in abrasive blasting, spraying of metals or paint—or as protection from splashing caustics and acid. The same purity of air as for air-line masks should be maintained.

Air-Cleaning Types of Respirators

24. Air-cleaning types of respirators include canister gas masks, cartridge respirators, and filter respirators. Such respirators remove the contaminant from the air stream either by chemical or by mechanical means. They do not provide protection where there is an oxygen deficiency and, since they must not be excessively large or heavy, they are limited as to the maximum concentration of contaminant with which they can successfully cope. When used within the limitations of their design, they are useful and efficient devices.

Canister Gas Masks and Cartridge Respirators

25. Both a canister gas mask and a chemical cartridge respirator afford respiratory protection against gases and vapors. They are similar in function but differ mechanically. The canister gas mask uses a full facepiece and a large canister, whereas the chemical cartridge respirator uses a half-mask facepiece and one or two small cartridges. Either type can be obtained with filters to make them effective against dispersoids. The cartridge-type respirator should be used only where the concentration of the injurious material is so low that damage will result only by long continued or repeated exposure. At the present time, Bureau of Mines approval may be obtained only for type B (organic vapor) and type BE (dust, fumes, and mists in combination with organic vapors). These types are approved for concentrations not in excess of 1,000 parts of organic vapor per million parts of air. The specification permits the leakage of not more than 5 ppm of carbon tetrachloride after the passage for 90 minutes of 32 liters per minute of an atmosphere containing 1,000 ppm of carbon tetrachloride. It also permits the leakage of not more than 5 ppm after the passage of this same test atmosphere for 40 minutes at 64 liters per minute.

FIGURE 8. Single chemical-cartridge respirator. (Courtesy Pulmosan Safety Equipment Corp.)

FIGURE 7. Canister gas mask. (Courtesy Davis Emergency Equipment Co., Inc.)

26. Canister gas masks are approved for use in atmospheres containing concentrations up to 2 per cent of most gases or 3 per cent of ammonia. If there is any doubt as to the type of hazard or the type of gas mask to be used for a known type of hazard, the manufacturer should be consulted.

27. The canisters of gas masks are painted with colors to identify those to be used against the most common types of hazardous atmospheres as follows:

Black
Organic vapors
White
Acid gases
Yellow
Organic vapors and acid gases
Green
Ammonia
Brown
Organic vapors, acid gases, and ammonia
Red
All industrial gases, including carbon monoxide, smoke, and fumes
White with green stripe
Hydrogen cyanide
White with yellow stripe
Chlorine

28. Since canister gas masks ordinarily are emergency equipment which will be used under conditions of strain and excitement, care should be taken to locate them where they will be readily accessible under conditions of any predictable type of emergency and so that they can be most easily put into operation when needed. This means that each gas mask should be kept in a cabinet convenient to the place where it is to be used (just *outside* the door of a refrigeration room, for example) and readily accessible to all personnel who are trained in its use. The place chosen should be as cool and dry as possible. The canister may be damaged by excessive moisture during storage. The rubber parts of the mask and harness are damaged by excessive temperature and especially by direct sunlight.

FIGURE 10. Special application for gas mask. (Courtesy Acme Protection Equipment Co.)

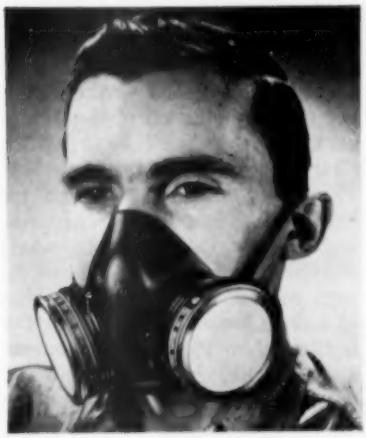


FIGURE 9. Twin chemical-cartridge respirator with mechanical filter. (Courtesy American Optical Co.)

29. A definite routine of maintenance should be set up so that each mask will always be ready for use when needed. A card catalog should be kept with a card for each mask which will indicate the date of latest inspection of the mask and latest replacement of the canister and the amount of use, if any, which the canister has had.

30. The canister attached to a facepiece with the bottom opening sealed (as it should be except when actually being worn) should be replaced at least annually whether or not it has been used. At the time of replacement of the canister, the facepiece, harness, hose, and head band should be carefully examined for any sign of leaks or deterioration, and should be replaced if any is found. If the mask is used only for emergencies, it is well also to replace the canister after each use rather than to try to keep track of the amount of use it has had.

Filter Respirators

31. A mechanical filter respirator can be designed to give satisfactory protection against almost any form of particulate matter. The major items to be considered in the purchase of such a respirator are the resistance to breathing offered by the filtering element, the adaptation of the facepiece to various sizes and shapes of faces, and the fineness of the particles to be filtered out of the air. The latter factor controls the required fineness of the filtering element, and (if the breathing resistance is to be kept low) the fineness of the filtering element controls its size.

32. The American Standards Association Code* requires that the complete respirator show a resistance to inhalation not greater than 50 millimeters (2 inches) of water at an inhalation rate of 85 liters (3 cubic feet) of air per minute after exposure to test conditions. The resistance to exhalation at the same rate may not exceed 25 millimeters (1 inch) of water. Many respirators approved by the U. S. Bureau of Mines are superior in performance to the resistance standards listed in the Bureau's Schedule.

33. An excessive breathing resistance causes a needless waste of energy which might better be turned into useful work. If breathing against a high resistance is long continued, it may be harmful. A filter of greater porosity may combine low resistance with a fairly small area, and may contribute something to comfort by catching larger particles which normally would collect in the nose and throat. Such a filter will

**Protection of Head, Eyes and Respiratory Organs*, Z2-1938, National Bureau of Standards Handbook H24, American Standards Association, New York 17.

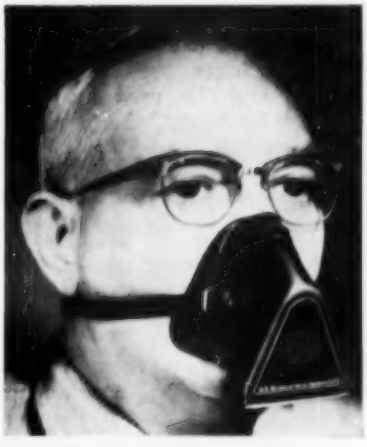


FIGURE 11. Filter-type respirator. (Courtesy Willson Products Division, Ray-O-Vac Co.)

not provide any protection against the fine particles which are actually inhaled and get down into the lungs.

34. The filtering efficiency of a mechanical filter improves as it is used and as the coating of fine particles is built up on and in it. These particles act as a filter-aid to collect the new material coming in. But as the filtering efficiency increases, the breathing resistance also increases so that it is necessary to clean or replace the filtering element at regular intervals.

35. The industrial safety engineer should familiarize himself with the types of hazards for which respirators are approved. He should use only those respirators which are approved by the U. S. Bureau of Mines for the particular conditions with which he is dealing, with the exception of the control of exposure to certain insecticides for which respirators are tested and listed by the U. S. Department of Agriculture.

Care of Respiratory Protective Devices

36. All respiratory protective devices, when not in use, should be stored in a clean, cool, dry place, out of direct sunlight, to retard the deterioration of the rubber parts. All parts, with the exception of canisters and cartridges, should be cleaned after each use. The facepieces and airlines or hoses may be washed with soap and water, rinsed with clean water, and dried. Filters and cartridges are simply replaced, and the used ones are discarded, except the long-life type of felt or fabric filters which may be cleaned according to manufacturer's instructions approved by U. S. Bureau of Mines.

37. Before being passed from one employee to another, the devices should be sterilized. The modern quaternary ammonium salt disinfectants are recommended for this purpose since they are not particularly irritating to the skin if it happens that they are not completely rinsed from the device after sterilization.

38. Since these quaternary compounds are also detergents, the devices will be sterilized well enough if they are washed in a hot (120 F) solution of the detergent, rinsed in hot (140 to 160 F) clean water and permitted to dry. They may also be sterilized by immersion for 10 minutes or more in a 40 per cent solution of formaldehyde diluted with 9 times its own volume of water, or by exposure to formaldehyde vapor for not less than 10 minutes. Sodium hypochlorite, bleaching powder, or other strong oxidizing agents are not desirable for sterilizing rubber parts. They are adequate for sterilizing materials which are not damaged by oxidation.

39. Where a number of respirators are in use, a central station should be set up for their care and maintenance, as well as for the care and maintenance of other items of safety equipment. Each employee should be provided with two respirators and with a locker or hook at the central station so that he can turn in his used one at the end of each shift and receive the other one in exchange—cleaned, serviced, and ready for use. The respirators should be marked so that it is possible to return them to the same employees.

REFERENCES

1. Bureau of Mines, Information Circular No. 7636, *List of Respiratory Protective Devices Approved by the Bureau of Mines*, U. S. Dept. of Interior, Washington 25, D. C., June 1952.
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4. *Respirators for Field Use for Inhalation Protection from Dusts or Mists of Parathion Insecticides*, U. S. Government Interdepartmental Committee on Pest Control, Department of Agriculture, Bureau of Entomology and Plant Quarantine, Washington 25, D. C., May 1950.
5. Bureau of Mines, *Approval Schedules Nos. 13, 14, 19, 21, and 23*, U. S. Dept. of Interior, Washington 25, D. C.

ACKNOWLEDGMENT

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Something Different In Tents

NEW YORK CITY frequently comes up with the unusual—and its latest is a tent on bustling Park Avenue!

But the tents are familiar to Manhattanites: They protect street crews of Consolidated Edison Company of New York.

Composed of a comparatively new protective-covering fabric developed by Herculite Protective Fabrics, Inc., Belleville, N. J., the tents are bright yellow, which provides easy identification, particularly during limited-visibility periods in traffic-congested areas.

The coated vinyl plastic tents are waterproof, minimizing chance of workmen being rainsoaked while handling electrical apparatus or delicate wire-splicing tasks.

The fabrics—used for tarpaulins and similar protective coverings—combine color, high strength and resistance to weather. They are a combination of nylon and vinyl plastic components electrically welded to sustain stress.

In addition, the fabric won't rot or mildew and is waterproof. And it won't support combustion. Further, grease, oils and acids wipe clean with a wet cloth.

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Stairs, Ramps, Fixed Ladders 22

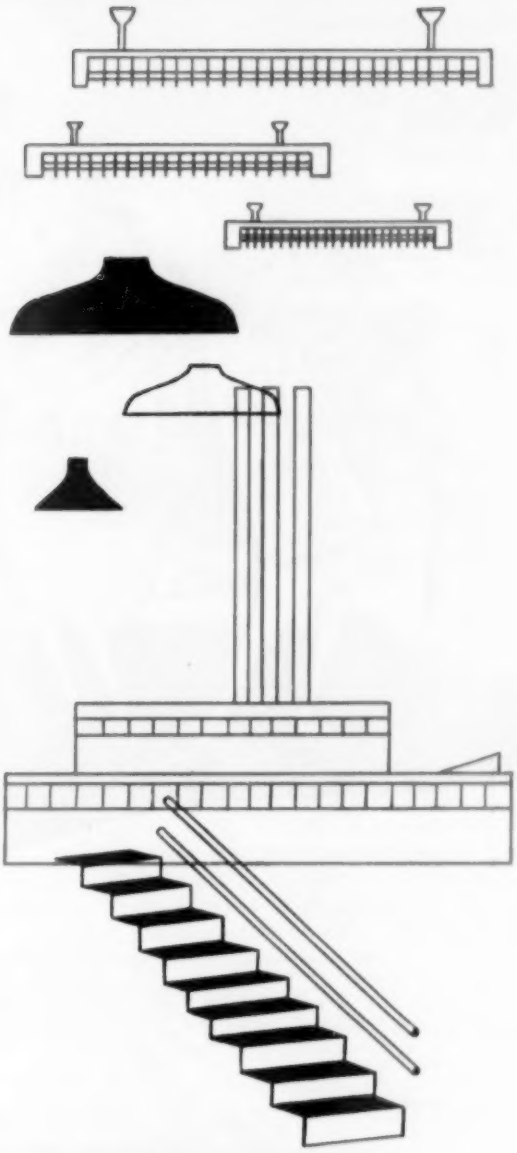
• • •

TO APPRECIATE the modern industrial plant, one has only to compare it with one built 50 or even 25 years ago. It is cleaner, safer and brighter—a much more pleasant and healthful place to work.

Industrial engineering has made remarkable progress in using equipment and human skills without undue hazard or strain on the worker. Safety sometimes has been achieved directly; often it has been a by-product of new and more efficient methods.

Preplanning an entire plant, or even revisions in buildings, equipment and processes, can bring a high degree of built-in safety and hygiene. Such features are conspicuous in many buildings designed since World War II.

When new construction work is in the planning stage, many faults in layout and equipment can be foreseen and avoided.



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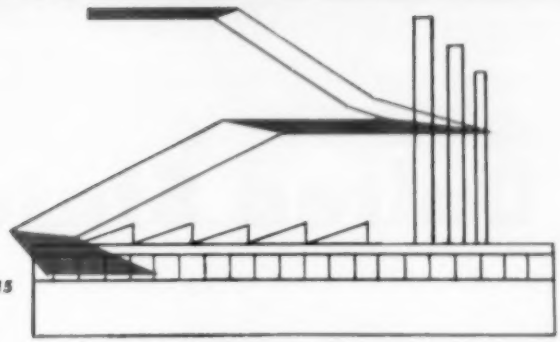
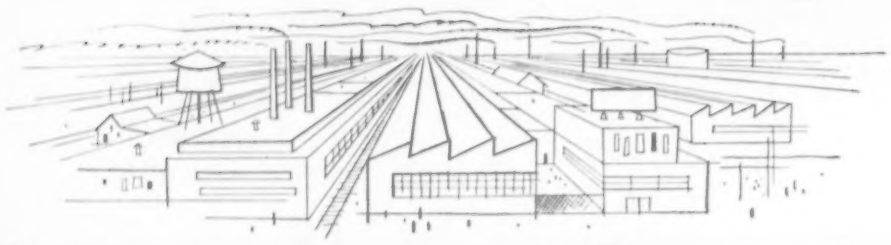
PLANT DESIGN and CONSTRUCTION



US RUBBER Matting



"It's like standing on a cloud," say workmen about U. S. Foot-Ease Matting

Standing continuously on hard flooring fatigues and slows down 7 out of 10 workers, costs management hundreds of millions a year in lost man-hours. But Heavy-weight Harry or Fallen-Arch Frank—*everyone* does better work standing on U. S. Foot-Ease Matting. Feet are "cushioned" from the floor, foot and leg strains are stopped, and there are no more "aching arches".

U. S. Foot-Ease is made of tough, durable rubber compound, backed up by springy sponge rubber. It provides non-skid footing at all times, is available in a special ribbed pattern or a pyramid surface design. Easily cut to desired dimensions from 25-yard rolls of 36-inch width.

Obtainable at any of the 28 "U. S." District Sales Offices, at selected "U. S." distributors, or write us at Rockefeller Center, New York 20, N. Y.

In Canada, Dominion Rubber Co., Ltd.

US RUBBER Mechanical Goods Division

United States Rubber

The Safe Plant

Opportunities for built-in safety occur when
. . . Building a new plant
. . . Remodeling an old one
. . . Transferring from one building to another
. . . Rearranging departments

And here are some ways to use them . . .

THERE IS no better way to start an accident prevention program than by preplanning it into the plant layout. A plant properly designed and laid out will have few "booby traps"—accident, fire and health hazards.

Many companies have plans checked by their safety departments or consultants. Plans should be approved by state and municipal authorities. Compliance with codes and regulations may avoid expensive changes in finished buildings.

Compliance with local regulations, however, isn't always a guarantee of safety. While city regulations at times may seem unnecessarily restrictive, they sometimes are too liberal for good practice.

Remodeling. It is not always possible to build a new plant, but much can be done with an existing building. Most industrial buildings in the United States are more than 25 years old and do not have the advantages of newer plants.

Layout, ventilation, lighting, sanitary facilities and materials-handling methods often can be improved at moderate cost.

Visual aids. In planning the layout, these aids help give a picture of the finished plant:
—Maps and drawings.
—Block templates and 2-dimensional templates.
—Scale models, ¼ in. to the foot.

General Factors

The site. Location often is dictated by manufacturing processes. Fire and explosion hazards demand isolation. Smoke, fumes, dust, odors and noise are other reasons for banning an industry from some neighborhoods.

Adequate outdoor storage should be provided. For flammable and explosive materials, specified minimum distances between storage areas and other property must be maintained.

Minimum distances between buildings of various types, sizes and occupancies are specified by fire-protection codes.

Coal and other bulky materials require considerable storage space. In some industries, so does disposal of solid wastes.

Employee transportation. Industry's continued movement to outlying locations creates transportation problems, particularly where transit service is inadequate. The problem is particularly troublesome for night shifts. Tardiness, absenteeism and labor turnover increase with difficulty in getting to and from work.

Some companies operate private buses, either free or at a low fare.

Many employees use car pools.

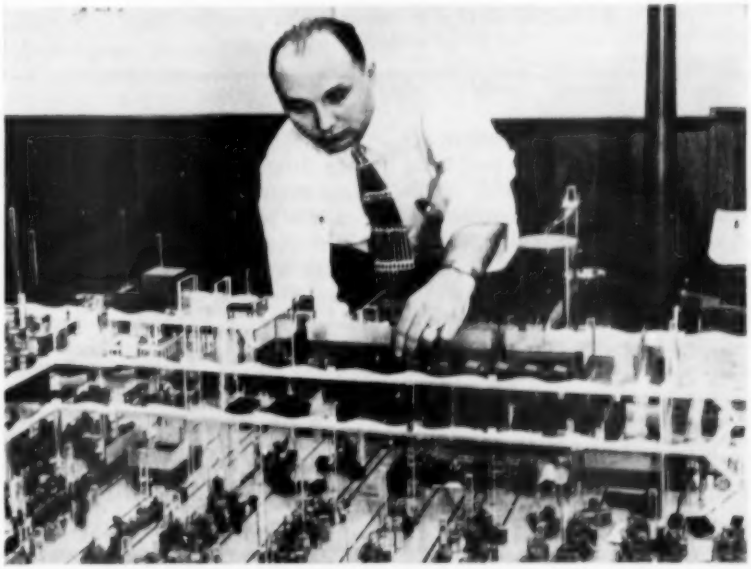
A new plant's effect on traffic and parking should be considered. An otherwise unobjectionable industry may be unwelcome because of added congestion and hazard.

Topography. Ground may be high or low, level or sloping, dry, swampy or undermined. These factors affect plans. Normal drainage or possibility of floods or washouts during heavy rains also must be considered.

Where flooding is possible, multistoried buildings have advantages. Upper stories provide a place to which valuable equipment and products may be moved.

Waste disposal. Sewers should not be located where leakage might contaminate water sources. In some instances waste material must be treated before it is discharged into streams or otherwise disposed of. In other instances, special sewerage systems may be needed.

Enough manholes or other openings for maintenance should be provided in sewerage systems.



SCALE MODELS give a realistic picture of the finished plant to aid in planning layout, flow of materials, and other details. Models may be home-made or purchased.

CHECK THESE IN THE PLANNING STAGE

1. **Site:**
   - Topography
   - Drainage
   - Room for expansion
   - Zoning restrictions
2. **Transportation facilities:**
   - Docks and wharves
   - Railroad
   - Highways and plant roadways
   - Mass transportation for employees
3. **Exits and other wall openings**
4. **Walkways: floors, stairs, ramps, platforms**
5. **Storage facilities:**
   - Flammable and explosive materials
   - Toxic substances
   - Raw materials
   - Finished products
   - Yard storage
6. **Electric wiring and installation**
7. **Illumination**
8. **Materials handling equipment:**
   - Cranes
   - Conveyors
   - Industrial trucks—power and hand
9. **Elevators**
10. **Boilers and other pressure equipment**
11. **Ventilation, dust control, air conditioning**
12. **Fire protection**
13. **Noise and vibration control**
14. **Health and Safety:**
   - Water—for drinking and sanitary uses
   - Waste disposal
   - Medical and first aid service
   - Personal protective equipment—distribution and repair facilities
15. **Personal service facilities:**
   - Parking
   - Washrooms and lockers
   - Food Service
   - Employment offices
   - Training programs

These subjects are discussed in greater detail in other sections of this issue.

Climate. In colder regions, ice and snow removal are problems. Keeping the plant warm while removing air contaminants may make ventilation complicated and expensive.

In hotter areas, heat and humidity, often increased by manufacturing processes will cause fatigue, low output and heat exhaustion. Many industries air-condition for comfort, as well as for the product.

In warm, dry climates, some materials may be stored outdoors. In others, covered storage may be necessary.

Roof loads of ice and snow and strong winds affect building design. Where hurricane-like storms are frequent, roof anchorage is important.

Data regarding windstorms and lightning in various regions are available from insurance companies. No area can be regarded as entirely safe from these hazards.

Protective lighting safeguards life and property, particularly in emergencies.

Fences high enough and strong enough to deter trespassers also are valuable in plant protection.

Entrances and exits. Where possible, rail, highway truck, industrial truck and pedestrian traffic should be separated. If impossible, then added precautions should be taken to prevent collisions.

Sharp turns, grades, blind spots, intersections, crossovers and congested points are hazardous.

Entrance and exit gates should be not less than 35 ft. from propertyline structures that might obscure vision. Gates for vehicular traffic should be arranged so that drivers leaving the premises have a clear view of cross traffic.

Passenger loading and unloading facilities should be arranged to avoid traffic hazards and reduce time and effort required to reach the plant. A plant on a main highway should provide space where buses can load and unload off the road.

Shelters for employees using public conveyances should be considered.

Some companies allow buses to run into the plant. They go down a ramp to a central location; em-

—To page 167

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Planned Lighting

For Sight, Safety and Production

CONTINUOUS rows of fluorescent lamps provide ample levels of shadowless light for the imposing stones in this printing plant.

LIGHT for modern industry's needs ranks high among electricity's many contributions to progress. It aids seeing efficiency and better work as well as morale and safety.

The proportion of occupational accidents in which poor lighting is a contributing cause is difficult to measure statistically but it has been estimated at 15 to 25 per cent. Many companies have reported reductions in accidents after modernizing the lighting system, along with better housekeeping and other benefits.

Complex industrial processes with much precision work make exacting demands on eyesight. Labor costs and investment in plant and machinery per worker continue to increase. Development of efficient and economical light sources have made industrial growth possible.

Artificial light has become the principal source for industry since natural light is not dependable, particularly in winter.

Lighting essentials. If the eye is to function effectively, the lighting system must:

—Provide adequate brightness at the work surface. The worker must see easily and accurately without eyestrain and undue fatigue.

—Minimize contrast, glare, and shadows.

—Supply light of right quality for quick and accurate judging of details.

—Contribute a pleasing atmosphere to the workplace.

Seeing Zones. Two zones in the work room must be considered in providing light.

The task zone is the job and its immediate surroundings. Work should be lighted adequately, shadows eliminated or diffused, and reflections from surrounding surfaces avoided.

The other zone is the rest of the room. A person looking up from work should not face glare from lighting fixtures or a bright wall or ceiling. Adapting eyes from light to darkness several hundred times a day is fatiguing.

If the surrounding area has a brightness at least one-third that of the task, visual conditions are reasonably good. Surroundings should never be brighter than the work zone.

Glare can be reduced by higher illumination levels throughout the room, also by finishing ceilings, walls, floors, and machines in light colors which reflect a high percentage of light. This reduces contrast between adjoining surfaces.

Directional and shadow effects are often desirable in general lighting. They accentuate the depth and form of solid objects. Clearly defined shadows are helpful in some operations, such as textile inspection. Harsh contrasts should be avoided.

Recommended levels of light for various operations will be found in many reference books. The most comprehensive work is the *IES Lighting Handbook*. Much useful information will also be found in manuals published by manufacturers of lamps and fixtures.

Existing levels are determined from readings with a light meter at points where light is needed. This device gives a direct reading of the number of footcandles.

General lighting is the minimum amount of light required for an area. This has been defined as uniform distribution of light to produce approximately equivalent seeing conditions throughout an interior.

Localized general lighting sources are usually arranged 10 ft. or more above the work. They should prevent too great a contrast in brightness between the more highly lighted work area

—*To page 50*

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(See also "Color," Section 2)

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What Type of Floor?

There's a "best" one for every occupancy

FLOORS, particularly in multi-story buildings, must be of adequate structural strength. The surface should be selected for the occupancy and traffic conditions. If this provision is observed, many sound structural materials may be used.

Troubles occurring with most floors are due to misapplication and abuse. It should be remembered, however, that even with normal use the factory floor takes a lot of punishment.

Here are suggestions for installing new floors or replacing old ones.

1. Divide the plant into areas. List the kind of service each will get. If the floor is subjected to more than one type of use, add another classification.

Consider aisles, storage areas, work places, heavy machining areas, loading docks, assembly areas, corridors, offices, rest rooms, cafeterias, etc.

2. Service requirements. Here is the information needed for each department:

Size of area. This will help to figure floor costs, which often decide choice of material.

Traffic. What is type and frequency? Note aisle widths and clearances. Is traffic chiefly pedestrian or vehicular? Resistance to slipping is important for pedestrians.

Loads. Include type of load—standing, impact, rolling, sliding, vibrating, etc.—also weight and concentration.

Water. Standing water, humidity, condensation, and temperature of water may affect some materials.

Temperature. Some materials become brittle at low temperatures; others weaken when exposed to heat.

Weather. Some materials may be used indoors or out. Some are adversely affected by sun, freezing, snow, or rain.

Fire and explosion hazards. Are there flammable dusts or vapors that could be ignited by a spark? Are plant processes a fire hazard?

Chemicals. Acids, alkalis, grease, and other chemicals will ruin some floors.

Product cleanliness. Floors that dust or collect dirt are unsatisfactory for food processing or precision machining.

Appearance. Looks are important for many occupancies.

Cleaning. Some floors can stand strong alkalis and steam. Others must be treated gently. Will the area demand vigorous cleaning?

3. Sources of information. Few plant men have the necessary know-how to handle all floor problems. There are, however, many sources of detailed information, including:

National Bureau of Standards.

Floor associations—Asphalt Institute, Asphalt Tile Institute, Maple Flooring Manufacturers Assn., Oxychloride Cement Assn., Portland Cement Assn., and Tile Manufacturers Assn.

Manufacturers' catalogs.

Floor experts, architects or engineers.

General Requirements

Eventual choice of a floor will be based on one or more of these qualities:

1. **Strength**—Sufficient to carry 4

COMMON FLOORING MATERIALS FOR INDUSTRIAL USES

AREA	Concrete	Asphalt hot mastic	Asphalt emulsion	Wood block	Wood plank	Asphalt tile*	Greaseproof asphalt tile	Resin binder mastic	Linoleum*	Terrazzo	Rubber tile	Ceramic tile*	Vinyl tile	Metal plates	Grating
Floors on grade	x		x	x	x	x							x		
Floors below grade	x					x	x								
Suspended floors			x		x	x	x	x	x	x	x	x			x
Driveways	x	x	x												
Ramps and loading docks	x		x	x	x										
Manufacturing areas	x		x	x				x							
Warehouses	x		x	x											
Stair treads	x					x			x	x			x	x	x
Offices						x			x		x		x		
Laboratories						x	x		x	x	x		x		
Cafeterias							x		x				x		
Washrooms	x					x				x	x	x	x		
Food processing	x						x					x			
Corridors	x								x	x			x		
Platforms, catwalks					x									x	x

*Also available in conductive grades for explosion-hazardous areas

times the expected static load or 6 times the moving load.

2. **Resistance to slipping**—Not slippery nor likely to become slippery through wear or contact with other materials.

3. **Durability**—Must stand up under normal traffic and wear evenly without developing holes and splinters.

4. **Maintenance**—Easy and economical to keep sanitary and in repair.

5. **Fire resistance**—Important in most industrial property.

6. **Comfort**—Resilience and low heat conductivity reduce fatigue.

7. **Quietness**—Another aid to reducing fatigue.

8. **Initial cost**—Often the deciding factor.

Flooring Materials

Each material has its limitations. Some with good durability and resistance to slipping may be too expensive for general use. These are often usable for limited special areas where a sure footing or resistance to chemical or abrasive action is important.

The accompanying table will serve as a guide in selecting flooring. It does not include all types of flooring or all problems concerning their use.

Smooth, hard surfaces, like concrete, are susceptible to chipping and abrasion. Heavy falling objects and trucks with steel wheels are destructive to the surface. Rubber tires are easier on floors as well as on the ears.

Concrete is suitable for a wide variety of interior and exterior uses. It is excellent for damp locations, but does not withstand acids. The floor should be graded for drainage.

Drains with strainers are needed where surface is cleaned by flushing or where there is possibility of flooding.

A durable roughened surface, resistant to cracking and dusting, can be obtained by a wood float finish to a mixture of pea gravel, sand and cement. Too smooth a surface is slippery when wet and is actually more tiring to the feet than a rougher one.

Hardening compounds or sealers prevent dusting.

Concrete floors can be made

—*To page 26*

Section of Modern Washroom showing Bradley Washfountains and a Bradley 3-stall Shower Unit. (Tile floors and walls by American Olean Tile Co.)

YOU TOO, CAN "SHOW-OFF" YOUR MODERN WASHROOM IF EQUIPPED WITH

***BRADLEY** washfountains*

Well-equipped, modern washrooms encourage cleanliness. Bradley Washfountains found in such washrooms save space, reduce maintenance and janitor work, cut piping connections 80% and water consumption over 70%.

With foot-control, no time is lost—no water wasted since supply is cut off immediately foot is removed from foot-ring. There are no contaminating faucets to touch—hands, arms and even the torso to the waist, can be washed—each person served fresh clean tempered water from the central sprayhead.

Colors, Too

Bradley precast stone and vitreous enamel models are made in colors to match or harmonize with tile floors or walls—further encouraging neatness.

Bradley *Washfountains* and *Showers* provide economical, super-sanitary washing and bathing facilities for factory men and women, "white collar" employees, and are widely used in schools, institutions and public buildings, too. Catalog 5601 shows complete line with specifications—copy free on request. BRADLEY WASHFOUNTAIN CO., 2237 W. Michigan St., Milwaukee 1, Wis.

Write for New Catalog 5601.

**BRADLEY WASHFOUNTAINS and SHOWERS are Distributed Through Plumbing Wholesalers.*

Section 1—Plant Design and Construction

Stairs, Ramps, Fixed Ladders

Permanent passageways between levels

IN PLANTS where operations are conducted on more than one level, stairs and ramps carry a heavy volume of traffic. Fixed ladders are used for access to locations where stairways would not be practicable.

Their use is governed by these conditions:

Stairs: Where grade is between 20 and 50 degrees from the horizontal.

Ramps: Should slope as little as possible; 15 degrees is recommended maximum.

Fixed ladders: For grades over 50 degrees.

Stairs

Long stair flights should be avoided. Landings every tenth or twelfth tread are recommended.

For grades between 7 and 20 degrees, a combination of stairs and level landings may be used.

Adequate light should be provided for stairways. Burned-out lamps should be replaced promptly.

Treads and risers. Ratio between depth of stair treads and height of risers determines the angle or pitch of the stairs, which should be between 30 and 35 degrees from the horizontal.

Tread width and riser height must be constant for each flight.

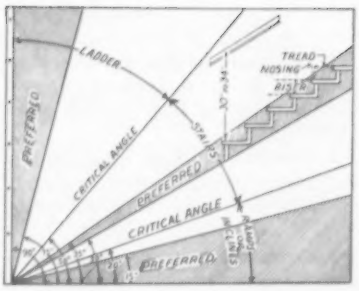
Winders should be avoided if possible. Wedge-shape treads make it more difficult to ascend or descend safely.

Treads must be wide enough that, in descending the stairs, the ball of the foot does not project beyond the nosing and the heel does not strike against the riser above.

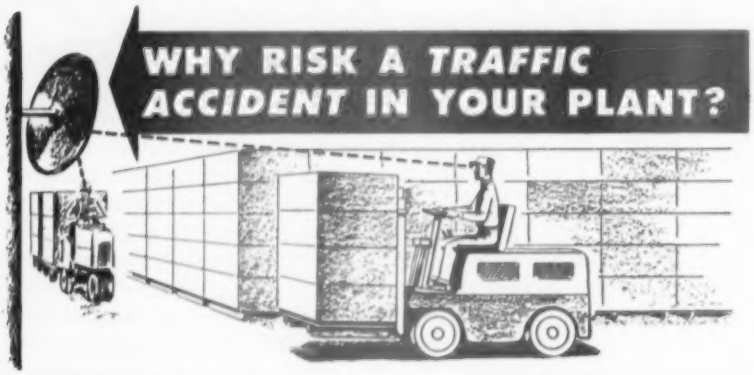
Building Exits Code, A9.1, specifies that treads of new stairs shall be not less than 9½ in. exclusive of nosing; also that no tread of less than 6 in., exclusive of nosing, shall be permitted.

Stairs subjected to severe use should have treads with a durable non-slip surface. Materials used for original installation or repairs include:

Abrasive metal
Steel with extruded patterns
Grating
Plastic compounds
Rubber and fabric with abrasive surface.



RECOMMENDED angles for ladders, stairs and ramps.



KLEAR-VU SAFETY MIRRORS are the answer to the dangerous blind corner problem in your plant or warehouse. They are also adaptable for outdoor use in your parking lot, loading dock area or other points where traffic converges.

Mounted at cross aisle intersections, entrances and exits at a height of 8 to 10 feet, Klear-Vu Safety Mirrors clearly reflect oncoming intersection traffic to both power truck operators and pedestrians.

Style	No.	Dimensions
Circular Convex Glass	120	12" dia.
Circular Convex Glass	180	18" dia.
Circular Convex Glass	240	24" dia.
Circular Convex Glass	300M.R.	30" dia.
Circular Convex Glass	360M.R.	36" dia.
Flat Glass Rectangular	918	9"x18"
Flat Glass Rectangular	1640	16"x24"

M.R. indicates metal rim.

Available in either convex or flat glass styles, the mirrors are easily installed and quickly adjustable to any desired angle.

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SAFETY FLOOR MATS

MATS and RUNNERS
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FATIGUE REDUCTION
FLOOR PROTECTION
SLIP PREVENTION

Problems with Grease or Oil on floors.

Wet floors and walkways, standing on cold concrete floors.

Switchboard matting to meet A.S.T.M. Specifications.

Stock on hand for immediate shipment.

BRABROOK experience of more than 20 years is at your service.

A. N. BRABROOK, INC.
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"Not a slip or skid accident since we put it in"

The ALGRIP safety story *is* a good one. This exceptional safety floor plate—the world's *only* abrasive rolled steel floor plate—provides super-safe footing under the *most hazardous* slipping conditions.

ALGRIP is made by a patented process during which grinding-wheel type abrasive particles are rolled—not coated—to a controlled depth as an integral part of tough steel plate. Usage merely exposes more abrasive particles which act as tiny, yet powerful traction grips.

Make a test installation in your worst slipping area. Use it as an overlay or as independent flooring. ALGRIP fabricates easily, requires minimum maintenance, and will pay for itself through reduction in accident and insurance rates.

ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—*approved for safety by Underwriters' Laboratories*

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

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Name_____

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City_____ Zone_____ State_____

A.W.

OTHER PRODUCTS:
A.W. SUPER-DIAMOND rolled steel floor plate—Plates—Hot and cold rolled sheet and strip—(Alloy and Special Grades)

Risers should not be more than 8 in. nor less than 5 in. in height. Greater or less height will cause an unnatural stride which may result in a serious fall.

Railings and handrails. ASA Code *Floor and Wall Openings, Railings and Toe Boards, A-12,* requires that every flight of stairs having 4 or more risers shall be equipped with standard stair railings or standard handrail as specified.

Spiral stairways are installed where there is not enough space for conventional stairways. Both types of stairs can be installed by plant personnel from standardized metal parts obtainable with a variety of slip-resistant treads.

Ramps

Ramps facilitate wheeled traffic between levels. For foot traffic they are preferable to stairways when it is practicable to use them. They should be built to the least slope possible. Maximum recommended slope is 15 degrees. A rise of more than 1 ft. in 10 is prohibited in some states.

For wood ramps materials used in construction should meet the requirements for scaffolds. Width should be adequate for traffic and open sides should be protected with standard railings 42 in. high.

Toe boards should be installed where the ramp extends over a work place or passageway. Cleats 16 in. apart are needed on steep inclines.

Planks should not overlap. The length of the plank should run the long way of the ramp. Ramps used for wheelbarrows should have an odd number of planks with no cleats on the center plank. Width should be not less than 3 ft.

Concrete ramps are recommended for heavy traffic. Anti-slip surface is obtained by rough floating or incorporated in the finish coat. Hardeners and troweling should be avoided.

Concrete that has been worn smooth can be roughened by scrubbing with dilute nitric or muriatic acid. The surface is then hosed to remove all traces of acid.

Ramps used by heavy vehicles, such as power trucks and heavy-duty hand trucks, should have solid curbs as well as handrails.

Ramps included as part of aisles or traffic routes should be as wide as the aisle to avoid bottlenecks.

Splinters, nails, irregularities and breaks in the surface should be repaired immediately. Cracked or pitted concrete can be resurfaced with one of the numerous flooring compounds on the market.

Outdoor ramps and platforms should be kept clear of snow and ice in winter. If ice cannot be removed immediately, sand or cinders may be applied to give traction. In cold climates radiant heating installed in the concrete is often a good investment.

Fixed Ladders

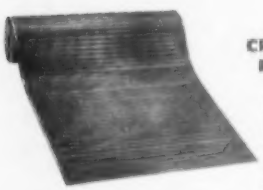
Fixed ladders should have parallel sides of wood or metal, and should be permanently fastened

WEAR PROOF Rubber Matting

GREATER PROTECTION - BEAUTY - SAFETY

SHAD-O-RUG

- Heavy duty live rubber
- Standard 48 in. widths in black, red, tan or green
- Also available in grease, oil, chemical proof NIRU (grey or white)
- Extra durable — Economically priced



CROSS RIB RUNNER

Same exclusive "V" Rib. Easy to clean! 48" or 36" width, in black, red, green or tan — NIRU in grey or white.

WINDSHIELD WIPER ACTION

1. Dirt is scraped off shoes by heavy duty "wipers."
2. Dirt falls into slots for easy cleaning.

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MADE BY THE OLD RELIABLE...

WEAR PROOF MAT CO. 2156 FULTON ST., CHICAGO, ILL.

SLIP-ON GUARD

PREVENTS FLUORESCENT LAMPS from FALLING

NO ACCIDENT A DAY KEEPS THE DOCTOR AWAY

GETS-A-LITE GUARD and GUIDE

Quickly and Easily Installed by Anyone — No Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

GETS-A-LITE CO. — Dept. NS-37

3865 N. Milwaukee Ave., Chicago 41, Ill.

MULTIGRIP FLOOR PLATE is high-safety, low-upkeep factor at Gulf Refinery

Port Arthur, Texas . . . hometown of huge refineries. Here, rambling refinery units of Gulf Oil Corporation are connected by a labyrinth of catwalks, ladders, ramps, walkways and steps. Traffic lanes such as these call for durability, safety and cleanliness. That's why you see USS Multigrip Steel Floor Plate wherever you look.

Multigrip tough steel floor plates have flat-topped, clean-edged risers that mean safe traction *from any direction*. The plates stand up under rugged service, year after year, without chipping, cracking or splintering. And cleaning them is a breeze—a hose or broom does the job. You can cut, weld, bend or shape Multigrip with ease, and large plates mean minimum installation waste. For increased safety and reduced maintenance . . . specify USS Multigrip Floor Plate.

Flat-topped risers give years of accident-free service.

Multigrip is available in large plates, eliminating waste of material and providing quicker installation, thus reducing cost.

Multigrip may be cut, bent, formed or welded.

UNITED STATES STEEL CORPORATION, PITTSBURGH
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UNITED STATES STEEL SUPPLY DIVISION, CHICAGO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **multigrip**

FLOOR PLATE

Sold by leading distributors from coast to coast

7-209

UNITED STATES STEEL

at top, bottom and intermediate locations. If 20 ft. or longer, the ladder should be provided with cage or basket guard.

Fixed ladders over 30 ft. long should be built in zigzag sections, unless cages are used, and should be provided with platforms at intervals of not more than 20 ft.

Side rails should be carried 3½ ft. higher and preferably goose-necked. Openings more than 18 in. between the ladder and the working platform should be protected by a landing platform. ***

Floors

—*From page 21*

conductive and non-sparking with surfacing compounds containing non-ferrous metallic aggregate. This treatment also makes the floor more wear resistant.

For repairing holes and cracks some compounds are superior to concrete. Patching with concrete, even when well done, may crack under heavy loads.

For painting, a general purpose floor enamel may be used but finishes prepared especially for concrete are more durable. New concrete should be treated with zinc sulphate solution to neutralize alkalinity.

Concrete provides a rigid and substantial base for resilient types of flooring.

Resilient non-slip mats are an aid to comfort where employees must stand in one position for long periods. Those who move about in their work are less likely to complain about floors being cold or hard. Footwear also has a bearing on comfort.

Asphalt (hot mastic) is non-dusting, elastic, odorless, and easily repaired. Problems of application restrict its use indoors.

Asphalt is resistant to weather and moisture but is affected by oils, solvents, acids and alkalis. It stands up well under traffic but ordinary grades soften at temperatures above 95 F.

Harder grades of asphalt remain firm up to 158 F. There are also acid-resisting grades.

Asphalt emulsion, sold under various trade names, is made into a mortar with sand and cement and laid about one-half inch thick. It is used extensively for patching. On a substantial wood base it will carry moderate traffic; with a concrete base it will take heavy trucking. The surface is somewhat harder than the hot mastic type. Both types are affected by oils and solvents.

Mastic flooring of other types usually has a resin binder. The materials are generally resistant to oils, solvents and alkalis, but the manufacturer should be consulted about the exposure. These materials are relatively high in price and are used principally for patching and for resurfacing limited areas.

Ceramic tile is frequently used where oils, acids or alkalis are present and in food product plants where floors must be washed frequently.

Asphalt tile is suitable for offices, stores, light manufacturing areas, and floors below grade.

the new basic material, all in one piece (including channels), not welded, riveted or expanded in steel or aluminum, in standard sizes and gauges. Safety GRIP-STRUT presents an open space, in a diamond pattern, in excess of 55% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

Work Platforms

Flooring

Machine Guards

Balconies

Important Safety Features

- ★ Fire proof
- ★ Slip proof
- ★ Maximum strength
- ★ Minimum weight
- ★ Easy to stand on
- ★ Cool in summer—warm in winter

Big Economy Features

- ★ For balconies—no extra light needed below—no extra heat.
- ★ No extra supports necessary—channels are integral part of the material
- ★ No secondary sprinkler heads needed
- ★ Self-cleaning
- ★ Cut and installed like lumber by your own maintenance force
- ★ Low in original cost

Distributors in all principal cities. Consult yellow pages in phone book under "GRATING."

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GRIP-STRUT division
THE GLOBE COMPANY • *Manufacturers since 1914*
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CONDUCTOMETER

to make your plant SAFER...

Be sure to investigate Conductometer®, the easy-to-operate device for measuring the electrical resistance of flooring, personnel and equipment. A necessity where gases and explosives are used or stored. Helps prevent dangerous and costly explosions. U.L. Listed. Meets N.F.P.A. Requirements. Write for free details now.

As a further step toward greater plant safety inquire about the special conductive floorings and finishes manufactured by our business affiliate, Federal Flooring Corporation.

CONDUCTIVE HOSPITAL ACCESSORIES CORP.
FEDERAL FLOORING CORP.
New York 17, N. Y. 82 W. Dedham St. Boston 18, Mass.

Several grades are available: industrial, standard, greaseproof, conductive, and greaseproof-conductive. It is moisture resistant but susceptible to indentation.

Asphalt tile is lower in price than most types of flooring. It is non-slippery in its normal state and can be kept in good condition with non-slip floor finishes. Solvent waxes should not be used.

Linoleum is quiet and comfortable underfoot. It is used in offices, laboratories and workrooms where cleanliness is important. Heavy gauge linoleum will withstand loads up to 75 lbs. psi. without permanent marking. Since highly polished linoleum is extremely slippery, the choice of a finish is important.

Rubber is resilient and has high dielectric strength which is undesirable where static electricity is a problem. Conductive types of rubber flooring are suitable for such locations. Abrasive rubber flooring is useful for stair treads, elevator sills, thresholds.

Vinyl plastic, usually in tile form, is durable and decorative but relatively high in price. It resists acids, alkalis and most organic solvents. The surface is nonporous and easy to keep clean.

Wood block is used for heavy duty general purpose floors. A floor of this type is durable, relatively quiet and comfortable under foot and does not become slippery. Blocks laid on a smooth, rigid base will stand up under heavy trucking and are not likely to crack. Blocks should be im-

MANY flooring compounds can be used for patching or resurfacing various types of floors.

Prevent costly slips with low-cost FLINTDEK!

Slips come suddenly, unexpectedly. And when they occur you may lose the services of needed employees . . . suffer costly damage or breakage . . . increase your accident insurance rates! X marks the spots where Flintdek Anti-slip Coating should be a must.

X . . . Be sure to use Flintdek* on steel, concrete, wood and other uncoated surfaces made dangerous by oil, grease, wear, weather. It dries quickly, bonds permanently.

X . . . Use Flintdek around machinery, on pedals, steps and ladder treads . . . on ramps, platforms, floors and decks. In locker rooms, lavatories, showers. It's your sure protection against slipping.

X . . . Flintdek is *not* a paint. It is a synthetic, resinous plastic containing a mineral filler—offering a surer footing when surface is wet. Comes in 5 harmonizing colors.

X . . . Flintdek is resistant to fire, water, oil, gasoline, dilute acids, alcohol, fats and greases. Properly applied, it won't chip, crack or peel. And it's *easy* to apply . . . you simply trowel it on!

X . . . Flintdek offers you safety you can count on. It is classified and listed as an anti-slip flooring surface by Underwriters' Laboratories, Inc. And its COST is low . . . covers approx. 50 sq. ft. per gallon.

*Reg. U. S. Pat. Off.

Send for application data on Flintdek Anti-slip Coating today

FLINTKOTE *Products for Industry*

THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION

30 Rockefeller Plaza, New York 20, N. Y.

BOSTON • CHICAGO HEIGHTS • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA

In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.
In London, England: Industrial Asphalts Company, Ltd.

Slips are costly...

BUT FERROX ISN'T

A few dollars worth of Ferrox underfoot would have prevented this painful, costly accident. Ferrox makes it easy—and inexpensive—to have safe footing on all walking surfaces, wet or dry. It can be troweled over wood, concrete or metal . . . sticks tight . . . resists oil, chemicals and weather conditions. One gallon covers approximately 40 square feet applied in two thin (1/32″) coats.

Check Your Safety Requirements Now

Why not take a walk through your plant right now (and be careful!) to see how many places where Ferrox surfacing would reduce your accident risk. Machine areas, especially, need Ferrox for safe footing. So do stairways, walkways and ramps, shower stalls, washrooms, loading platforms and numerous other locations. Remember—slips are costly, but Ferrox isn't. Write to Dept. 21 for Ferrox bulletin.

AD 121

AMERICAN ABRASIVE FERROX

AMERICAN ABRASIVE METALS CO. · IRVINGTON 11, N. J.

pregnated with creosote for resistance to dampness.

Wood plank. Hard, close-grained wood provides a floor that is comfortable and reasonably durable under foot traffic. Under moist conditions, boards may swell and buckle. A heavy subfloor makes the surface flooring more resistant to moisture and traffic. Under heavy wheel traffic, boards may loosen or break frequently, causing hazardous conditions and excessive maintenance. A penetrating floor seal protects the surface and makes cleaning easier.

Fabric surfacing. Heavy fabric coated with mineral grains is used indoors and out for stair treads, ramps and around machines. The material can be applied to concrete, metal or wood. It is backed with adhesive to the surface under pressure. It wears well and resists water, oil and weather.

Steel plates are serviceable for platforms, stair treads, floors, hatchways. They wear well and are easily cleaned but are highly conductive of heat and are noisy.

Extruded patterns offer good traction and resistance to slipping. When worn, plates can be roughened with a welding torch.

Steel plates are also used over ducts which carry electric circuits or pipe lines. They are easily assembled and can be removed for servicing equipment.

Magnesite is suitable for light traffic. It must be laid on a rigid base. It should not be used where there is excessive moisture or hydrostatic pressure, as in basements. It is resistant to oil. A coat of bituminous paint should protect metal surfaces in contact with magnesite since it corrodes some metals.

Terrazzo floors are durable and easily maintained. The mixture can include abrasive aggregates to provide a non-slip surface. Sealers make it impervious to most acids. Where there is excessive foot traffic, as in building lobbies, rubber mats reduce slipping hazards and protect the surface.

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• • •

CLEANLINESS and order are outward signs of good management, careful supervision and a well-trained working force. These are factors that help in maintaining a good safety record.

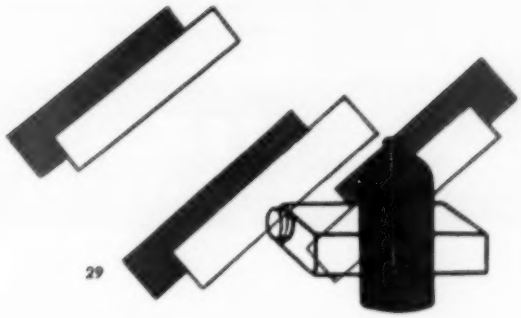
Good housekeeping is indicated by clearly marked and uncluttered aisles; adequate levels of glareless, shadowless lighting; floors free from litter and slipping hazards; orderly storage; functional use of color, and well-maintained equipment.

Building maintenance involves much work above the ground. It requires sound ladders and scaffolds selected for the job and kept in the best of condition.

Housekeeping and sanitation need constant vigilance and recognition of their importance as productive activities.

2

HOUSEKEEPING and MAINTENANCE



"We've reduced our scrubbing time from 70 to 7 man-hours ... and our floors have never before been so clean!"

— says Foreman of
BURNY BROS. BAKERY, CHICAGO

Garage and stockroom floors in Burny Bros. large, modern bakery get daily scrubbing with a *Job-Fitted Combination Scrubber-Vac* and *Setol Cleanser*

THEY'RE an unbeatable team to speed the cleaning of oily, greasy floors. *Here's why:* A *Scrubber-Vac* completely mechanizes scrubbing. It applies the cleanser, scrubs, flushes if required, and picks up (damp-dries the floor) — *all in one operation! Job-fitted* to specific needs, a *Scrubber-Vac* provides the maximum brush coverage consistent with the area and arrangement of the floors. Its teammate, *Setol Cleanser,* is specially designed for the greater speed of *combination-machine-scrubbing* ... emulsifies grimy oil and grease *instantaneously* for fast, thorough removal by the machine's powerful vac. Moreover, *Setol* retains its strength longer than average alkaline cleansers. This, too, speeds the cleaning process ... saves on materials ... and cuts operating time of the machine, which in turn reduces labor costs. The *Scrubber-Vac* shown above is *Finnell's 213P,* for heavy duty scrubbing of large-area floors. It's *self-propelled,* and has a 26-inch brush spread. Cleans up to 8,750 sq. ft. per hour (and more in some cases), depending upon condition of the floors, congestion, et cetera. (The machine can be leased or purchased.) *Finnell* makes a full range of sizes, and *self-powered* as well as *electric* models ... also a full line of fast-acting cleansers. In fact, *Finnell makes everything for floor care!* Find out what *you* would save with *combination-machine-scrubbing.* For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2203 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.
Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

Plant Housekeeping

An index of efficiency and safety

HOUSEKEEPING is a complex subject, involving every phase of industrial operation. Its activities cover the entire premises — indoors and out. Its benefits often extend throughout the community.

Improved appearance of the workplace has a noticeable effect on employee morale but the benefits don't stop there. Productive efficiency, health and effective control of accident and fire hazards are also achieved by effort spent on cleanliness and order.

Housekeeping is the combined responsibility of management, supervision and employees. Maintaining the necessary interest requires constant stimulation through supervision and audio-visual aids.

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—Sanitation Is the Way We Live; Louis A. King, Jr., Jan. 1954.
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The Plant

A well-designed, well-built plant can be kept clean, orderly and free from hazard with much less time, effort and expense. Here are factors to consider:

—**Aisles:** Wide enough for movement of traffic, marked off by floor lines from work stations and storage areas.
—**Space:** Sufficient room for the individual to work.
—**Storage:** Adequate and convenient for materials and tools.
—**Materials handling:** Layout planned for material flow, with efficient methods and equipment.
—**Ventilation:** Good general ventilation, plus local exhaust ventilation to remove air contaminants at source.
—**Floors and walls:** Of construction and materials easy to keep clean and in repair.
—**Lighting:** Well distributed artificial light and effective use of available daylight.
—**Personal service facilities:** Clean, up-to-date washrooms and lockers; an inviting place where employees may eat lunch.
—**Waste removal:** Adequate facilities needed to prevent congestion and disorder.

Organization

An adequate crew of able-bodied, intelligent employees is essential. They should be well-trained in their duties and provided with necessary cleaning equipment and supplies.

Women are usually employed for lighter duties, such as office cleaning and routine care of women's rest rooms.

Cleaning Equipment

Vacuum cleaners. Heavy duty types are available in several models and capacities, with a variety of attachments. They are useful for removing dust from corners and from places overhead as well as for floor cleaning.

Where dust sources are close together and a large volume of dust must be removed, a piped system may be practical. Cleaning implements are attached to inlets located at frequent intervals. Some hotels and office buildings use this type of dust removal.

For most industrial uses, portable vacuum cleaners are more satisfactory. In most operations, the dust sources are widely scattered and portable equipment meets all requirements.

Floor machines of several types handle heavy jobs of floor cleaning efficiently. With them, floors can be scrubbed or dry-cleaned, waxed and polished. Like vacuum cleaners, floor machines can be obtained with a variety of attachments.

Crusts of dirt, oil and metal cuttings can be removed with revolving wire brushes much more quickly and thoroughly than by hand spudding.

For finer finishing, steel wool rolls can be used. A vacuum pick-up for collecting dust is essential for dry operations. Suction in connection with a scrubber damp-dries the floor quickly. Scrubbing, rinsing and drying can be done with a minimum of interruption to production.

Floor machines may be purchased or rented. Some manufacturers have service men who

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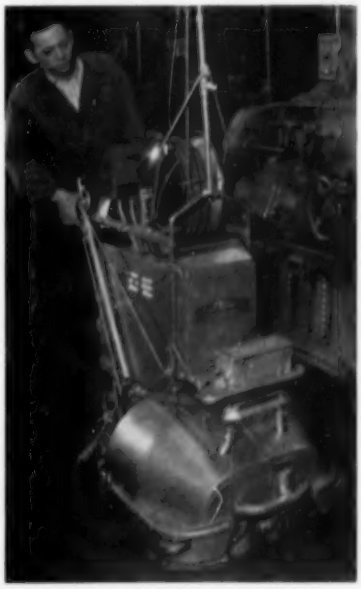

FLOOR MACHINE, self-propelled, applies cleaner, scrubs, rinses and damp dries in one operation. (Finnell System)

Wonder-Working Color

Here's what it can do:

- **Conserve light**
- **Improve visibility**
- **Create pleasant, restful surroundings**
- **Aid in maintaining good housekeeping**
- **Identify fire and accident prevention equipment**
- **Spotlight point of operation on machines**
- **Add punch to instructional and warning signs**

COLOR has many functional as well as decorative uses and its applications in industry are steadily growing. But it must be applied according to established scientific principles. Otherwise the result will be a riot of distracting hues. Paint manufacturers and color experts have conducted considerable research on the subject and help is readily available.

Background Colors

The old plan of white for ceilings and upper walls with "practical" dark colors for dadoes and machines is being replaced by color schemes which provide more cheerful and attractive interiors. Paint companies will be glad to furnish advice.

Sharp contrasts between bright and dark areas should be avoided. They require continual adjustment of the eyes in looking from one to the other, causing eyestrain and fatigue.

White is favored for ceilings; it reflects more light—80-88 per cent. But for rooms with low ceilings, or where people may look up at them, as in hospital rooms, cream, ivory or sky blue is preferable to solid white.

For overhead networks of girders, pipes and other equipment, colors of high reflectance also are desirable.

For sections of walls within the range of vision, soft tints, such as light gray, green or blue, are suitable. Soft gray, for example, is restful and does not show dust readily.

A dado the height of work benches and machines—about one third the height of the wall—makes soil and marks less conspicuous. It may be a deeper tone of the color of the upper wall but should not be too dark.

Floors should have a reflectance value of at least 25 per cent. For machines, benches and desks, 25 to 40 per cent is suggested.

Point of Operation

To make it easier to see work and avoid injury, spotlight the point of operation with paint. Paint the body of the machine one color and working areas another.

Four standard shades of "machine gray" are available. Critical parts can stand out in cream, light tan, or other light contrasting color.

Light sources and color. Type of light should be considered in planning the color scheme. Incandescent lamps reduce strength and intensity of color because the light has a slight yellowing effect.

Fluorescent lamps are offered in several types. The four most common are: standard warm white, standard cool white, de luxe warm type, and de luxe cool type. Cool white units give a bluish hue and can be used with blue, green and blue violet. Warm white is suitable for ivory, cream, beige, rose and tan. The de luxe lamps are used in plants where color discrimination is exacting, as for inspection, and in lounges, cafeterias and display rooms.

Color for Identification

Safety codes for the use of standard colors for identification of equipment and hazards have been developed by the American Standards Association. *Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment* Z53.1—1953 specifies uniform colors for marking physical hazards, for indicating the location of safety equipment and for identifying fire and other protective equipment.

Some chemical and petroleum companies have introduced minor variations from the ASA code, particularly where specific problems have been created by special products. (See "How Color Can Serve You," NATIONAL SAFETY NEWS, Sept. 1956, p. 30.)

Red is for identification of fire-protection apparatus, and for walls or supports on which extinguishers are mounted; flammable liquid containers (except

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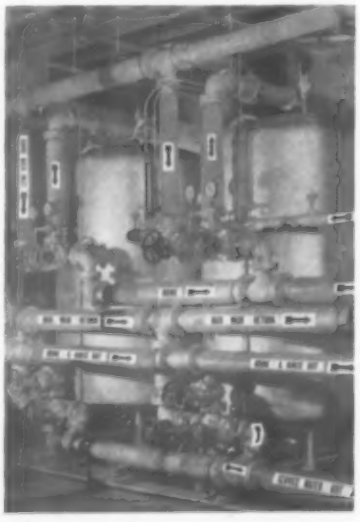

CONTENTS of pipes and direction of flow supplement coded color in identification. Labels are self-sticking tape. Light paint for tanks and surroundings conserves light. (W. H. Brady Co.)

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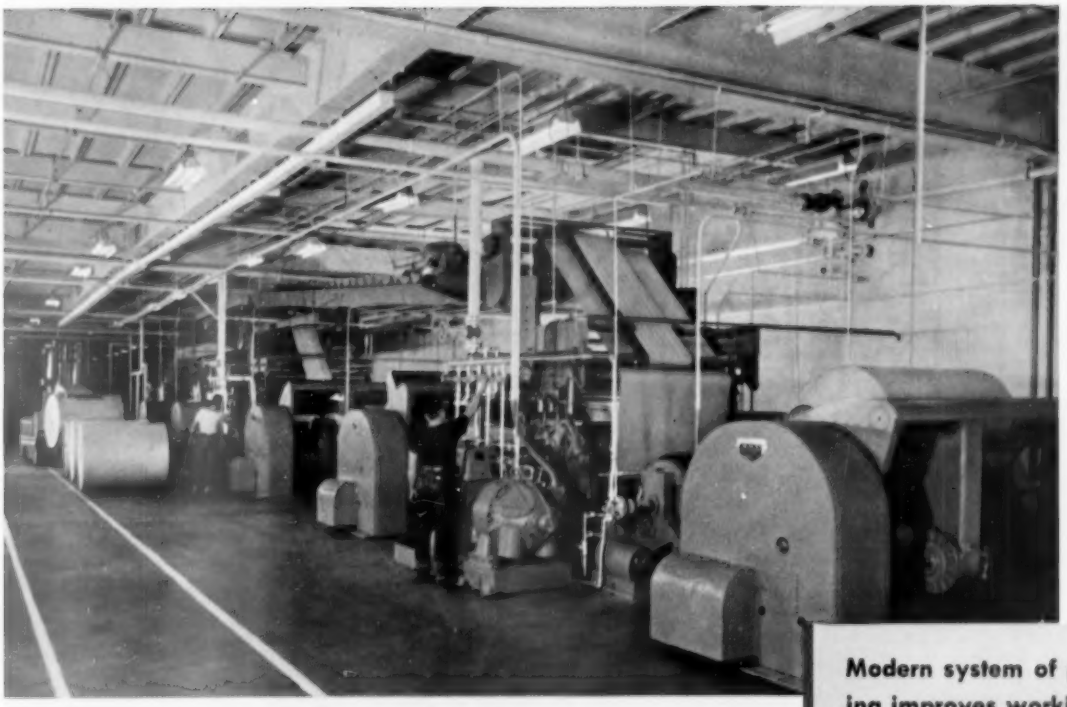

Modern system of painting improves working conditions in Cleveland plant of Hankins Container Company, where 30,000,000 sq. ft. of corrugated board are processed monthly

Pittsburgh COLOR DYNAMICS®

increases efficiency in making shipping containers

FOR MORE THAN two years Pittsburgh COLOR DYNAMICS has been proving that planned use of color is a profitable investment for management and workers alike in the Cleveland plant of the Hankins Container Company. This modern structure was painted according to the principles of this modern system to improve productive efficiency and provide more cheerful surroundings.

The Hankins Container Company fabricates corrugated paper shipping cases and inner packing, packages for electric light bulbs, and paper containers of many types. Thirty million square feet of corrugated board are processed monthly.

Interior walls and ceilings of this plant are painted with morale-building colors of high reflectance value to make work areas brighter. Eye-rest colors on lower walls reduce eye strain. Machinery in focal and eye-rest colors enables operators to see their jobs better, Safety colors on operating controls, mobile equipment and traffic lanes reduce danger of accidents.

How COLOR DYNAMICS contributes to higher efficiency and morale is best expressed by R. A. Rabatsky, manufacturing vice-president:

"**COLOR DYNAMICS** has been helpful in providing our employees with more pleasant environment. By reducing eye fatigue we have increased their efficiency. This system of painting has also contributed to improved morale. Our people take pride in their surroundings and help to keep work areas clean and orderly. From every standpoint, COLOR DYNAMICS has been helpful in bettering our operation."

Why not investigate how this modern method of painting will improve efficiency, morale and safety in your plant? To paint with COLOR DYNAMICS costs no more than a conventional maintenance job.

It's FREE—A Modern Color Plan for Your Plant

● We'll be glad to send you a free copy of our fully-illustrated book on the use of COLOR DYNAMICS in industrial plants. It explains simply and clearly what this painting system is and how to use it. Better still, we'll be glad to prepare a detailed color plan of your factory, or any part of it, without cost or obligation. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have a representative see you, or mail coupon at right.

Send for a Copy of this FREE Book

Pittsburgh Plate Glass Co., Paint Div., Department NSN-37, Pittsburgh 22, Pa.

☐ Please send me a FREE copy of your booklet "COLOR DYNAMICS."

☐ Please have your representative call for a COLOR DYNAMICS survey without obligation on our part.

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PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

The Lunatic Wept

ABRAHAM SIMMONS couldn't feel the frost that lined his tiny stone cage, or taste the swill they fed him, or chafe at his iron chains—so his keepers said. He was a madman.

But then, when his visitor, little Miss Dix, spoke softly, kindly, to him, why did he weep?

Dorothea Lynde Dix knew why. And her knowledge kept her fighting all her life to get the mentally ill away from pits and cages, whips and chains, and into hospitals.

In nearly 40 years, she paused only once—to render heroic service as superintendent of nurses in the Civil War. Then again she began investigating, writing, fund-raising, politicking, until this frail ex-school teacher had pushed a whole country into one of the finest reforms in its history: the sane treatment of the insane.

Dorothea Dix was fortunate in having one powerful ally: the American people. For as history will show, Americans are seldom self-satisfied; they long to do right. That urge has helped them build a strong, stable nation in a troubled world—and it has helped make their country's Savings Bonds a rock-ribbed assurance of security.

The will and purpose of 168 million Americans back U.S. Savings Bonds, back them with the best guarantee you could possibly have. Your principal guaranteed safe to any amount—your interest guaranteed sure—by the greatest nation on earth. If you want *real* security, buy U.S. Savings Bonds. Get them at your bank or through the Payroll Savings Plan where you work. And hold on to them.

Safe as America—U.S. Savings Bonds

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Portable Ladders

Industry's Indispensable Equipment

NO INDUSTRIAL or commercial establishment could get along without portable ladders. They are needed for occasional access to scattered points at higher or lower levels.

Where frequent access to any location is needed, stairs and ramps should be installed. Where room is insufficient for these, fixed ladders may be used.

Accidents involving ladders are seldom due to defects in materials or construction. Unfortunately, ladders suitable for home use are purchased for heavier duty in industry. Sometimes inspection and maintenance are neglected and ladders receive unnecessarily rough use.

Ladder accidents are often due to unsafe work practices, and sometimes to physical disability of the user.

Standards

A reliable guide is the American Standard *Safety Code for Portable Wood Ladders, A14.1-1952.* Ladders built according to its specifications are plainly labeled.

Another safeguard for the purchaser is the Underwriters' Laboratories label carried by ladders and ladder shoes which have passed the Laboratories' tests. At present only wood ladders are covered by the label and reexamination services.

Metal ladders are not yet covered by an ASA code. The Metal Ladder Manufacturers Association, organized in 1949, has established its own standards. Aluminum and magnesium ladders which meet its specifications will give satisfactory service. As in the purchase of all types of equipment, the manufacturer's reputation is the buyer's best protection.

Materials and Construction

Wood, which meets the requirements of weight and strength at moderate cost, is the most widely used material. Acceptable kinds and grades of wood are listed in the ASA Code.

Ladders may have either spreading or parallel straight lines. They may have sides flaring at the base to increase stability, and converging at the top for specific uses.

Laminated ladders. Side rails of laminated wood have high strength-weight ratio, are able to carry substantial loads after initial failure, give distinctive sound warnings as failure progresses gradually.

Laminated ladders are available in single and two-section extension ladders and several specialized types.

Light metals. Aluminum and magnesium alloys are light in weight and resistant to moisture. In case of overload there is deflection warning instead of sudden breakage. Prices are higher than for wooden ladders.

Metal ladders should be free from sharp edges and burrs on the side rails. Soft metal rivets that might shear off under load should not be used.

Metal ladders are conductors of electricity and should not be used around electrical equipment. Decals or painted warnings against such use should be carried on all metal ladders.

Single, extension, stepladders, platform ladders, and planks, stages and hangers are available in light metals.

Glass fiber and plastic. A new type of light-weight ladder uses a sandwich construction of glass fiber and polyester resin. Advantages claimed are high strength-to-weight ratio, non-conducting qualities and resistance to corrosion. Glass fiber reinforced side rails are plastic welded with aluminum or magnesium rungs to form an integral part of the ladder.

Standard single ladders, 8-16 ft. and extension ladders 16-28 ft. weigh approximately 2 lbs. per ft. In the heavy-duty grade single ladder 8-20 ft. weigh 2¼ lbs. per ft. and extension ladders 2½ lbs.

Types of Ladders

Stepladders are available in lengths up to 20 ft. Three types are listed by the Code:

I—4 to 20 ft., heavy duty
II—4 to 12 ft., medium duty
III—3 to 8 ft., light duty

More substantial construction is, of course, specified for the longer, heavier duty ladders.

—*To page 38*

EVERY PRECAUTION has been taken on this job. Ladder is in good condition with ladder shoes and crosspiece at top for use against window opening. Man on ground is holding ladder. To detour traffic, sign is supplemented by horses.

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—Ladders, Aluminum and Other Metal; Safety Reprint Gen. 7.
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—Protecting Wood Ladders from Decay; Feb. 1950.
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Scaffolds

Safe work platforms above ground

CONSTRUCTION and maintenance work requires many types of scaffolds. These range from sectional steel scaffolds erected on a large building job down to portable work platforms for maintenance work.

Metal scaffolding provided and erected by its manufacturer is used on all major construction jobs, replacing wood scaffolding put up by the contractor's men. Metal scaffolding installed by experienced men rarely fails in service. Accidents on these scaffolds usually are caused by unsafe work practices or physical deficiencies of the individual.

Men assigned to work at high levels should be selected carefully. Some are physically and temperamentally unsuited for such work.

Types of Scaffolds

For general use and for special trades, many types of scaffolds have been designed. Common types are:

—*Built-up*—Sectional frame; tube and coupler.
—*Hanging*—Heavy-duty suspended; light-duty swinging.
—*Rolling*—Movable units made by fitting casters to built-up scaffolds or to special aluminum components.

Every scaffold and its supporting members should have a factor of safety of at least 4.

Tubular steel scaffolds are used on large jobs where work will be carried on at great heights. Scaffolds may be purchased or rented. When rented, their erection and dismantling by experienced crews usually is included in the contract.

Steel scaffolds, except for the wood planks, are noncombustible. They offer less resistance to wind than all-wood scaffolds. Interchangeable parts make the scaffolding adaptable to many jobs and facilitate erection and dismantling.

Rolling scaffolds can be erected from sectional steel scaffolding components or tube-and-coupler scaffolding components and fitted with casters. There are three other types of rolling scaffolds:

—Sectional ladder scaffolds of steel or aluminum.
—Sectional aluminum scaffolds with interior or exterior stairway.
—Scaffolds made of folding one-piece sections.

These workstands provide more space than a platform ladder, permit more than one man to work and provide more space for tools.

Workstands of the wheelbarrow type can be moved easily by one man.

Telescoping portable towers are used for some maintenance work.

Caster locks should be provided on movable equipment to prevent movement while in use.

Swinging scaffolds are light-duty equipment primarily for men and hand tools. They are used for painting, tuck-pointing, glazing and other operations where scaffold height is adjusted frequently as work progresses.

ROLLING scaffolds provide mobile work platforms for a variety of maintenance. Outriggers are recommended when the work platform is more than 18 ft. high. (Patent Scaffolding Co.)

A swinging scaffold should be hung securely from eaves, cornices, or other reliable support, with strong hooks. Anchorage should be inspected before hooks are placed.

Ropes should be of the best grade manila not less than ¾ in., on at least 6-in. blocks.

Steel cable should be not less than 5/16 in. Steel cable is wound on a drum, not pulled by hand.

A safety belt and a life line extending from the roof to the ground should be worn by workers on a swinging scaffold. The safety belt rope should be tied to the life line with a triple sliding hitch.

Suspended scaffolds are supported by outrigger I beams attached to the frame of the building. They are recommended for use on buildings more than 5 stories high which have a frame to provide the overhead support. The scaffold is raised and lowered by steel cable operated by a winch.

Shackles or beam clamps holding cables should be securely fastened to outriggers with a stop bolt in the outer end of each outrigger. Cables should be securely fastened to outriggers and to the putlogs which carry the platform, or to the hoisting machines.

Wooden scaffolds are temporary structures built on the job. Attempted economies in materials and workmanship frequently result in scaffold failures accompanied by serious injuries, if not by fatalities.

Lumber for scaffolding should be inspected on delivery and stored where it will be protected from weather.

Spruce, fir, longleaf yellow pine, and Oregon pine are commonly used. Material should be straight grained, free from knots, checks, cracks, decay or other defects.

Structural grades of lumber should be used for scaffold planking wherever possible. Where these are not available, each plank should be inspected carefully.

No planks of less than 2-in. nominal thickness (1⅝ in. dressed)

The **RIGHT** product for the **RIGHT** job

That's how
LEGGE SAFETY FLOOR MAINTENANCE
Saves you money!

The cleaner or polish that performs wonders on the floors of a neighboring building may be all wrong for yours.

LEGGE suits the product to the job. And provides the Free services of a Safety Floor Specialist to see that the job is done right. The LEGGE Man surveys your floors for area, age, composition, condition, amount and type of traffic before making his recommendations. He examines the equipment available. Then he custom-tailors a program to your needs and works right with your crews.

He'll save you money—up to 33⅓%—on labor and materials. Your floors will look smarter, last longer. And he'll reduce slip-accidents by up to 98%.

LEGGE SAFETY FLOOR CLEANERS

TEXINOL: An all-purpose concentrate in liquid or jelly for surfaces which cannot be harmed by water. Cleans thoroughly, economically, leaving no slippery film on floors.

LEGSTRIP: Made especially for the stripping of resin-type polishes. Does an excellent cleaning job with no adverse affect to floor.

CLEANER #1: A primary cleaner for vigorous scrubbing before polishing. A concentrated paste compound that cannot mar surface or bleach color.

TEXSPAR: A heavy duty paste concentrate. Effective on cleaning tasks considered too difficult for ordinary cleaners.

TRAFCO CLEANER: A slip-resistant solvent that prepares floors to be polished with TRAFCO or TRAFLECO. Removes dirt, old wax and rubber burn marks.

FLOORSHINE: A 2-in-1 treatment for hard-surfaced floors. Combination cleaner and slip-resistant polish. Also effective as secondary maintenance on other polished floors.

Other cleaners available for specific requirements.

LEGGE SAFETY FLOOR POLISHES

LEGSURE: For all resilient floors. Dries to a lustrous, hard finish without buffing. Scuff-resistant, slip-resistant, dirt and-water repellent.

LECO: For linoleum, rubber, asphalt tile, cork, similar resilient floors. Gives high slip-resistant finish despite attractive gloss. Protects floors with durable film. A water-emulsion polish.

SAFCO: For asphalt tile floors. A water-emulsion polish with higher slip-resistance for harder surfaces. Apply either LECO or SAFCO with a mop.

TRAFLECO (or Trafco): For wood, cork, linoleum floors. A tough-wearing polish, ideal for heavily trafficked floors. Slip-resistant. Do not use on rubber or asphalt tile.

Other Safety polishes available for specific requirements. All Legge polishes are listed by Re-examination Service of Underwriters' Laboratories.

Also available are LEGGE Floor Seals for every type of composition; anti-slip products for use in unusual circumstances; damp sweeping implements; conductive coatings and personnel grounding devices.

MAINTENANCE OF CONDUCTIVE FLOORS

Many waxes and polishes form a hard coating that insulates the actual surface of the conductive floor from static-generating personnel and machinery. Contact is lost—static charges are no longer dispersed safely into the floor. Ordinary cleaning compounds also tend to insulate the conductive floor.

LEGGE Polishes, Cleaners and Seals are made to *retain* conductivity. Leading hospitals, government installations and factories use LEGGE materials to avoid loss of contact, loss of ohm resistance. Listed by Underwriters' Laboratories, they also conform with NFPA Code #56.

Write today for full information and Free booklet.

Walter G. LEGGE Co., Inc.

Dept. N-3, 101 Park Ave., New York 17, N. Y.

Branch offices in principal cities. In Toronto, J. W. Turner Co.

or less than 8-in. nominal width (7½ in. dressed) should be used.

Ladder-jack scaffolds are used chiefly by painters and electricians. They should not be used more than 22 ft. above ground or floor or on extension ladders. An unsupported span should not be more than 10 ft.

Railings and toeboards. Most codes require railings on scaffolds more than 12 ft. high, but railings are desirable on lower scaffolds. A top rail should be 36-42 in. above the floor with an intermediate rail halfway between the top rail and the walkway surface.

Toeboards are needed to prevent tools or materials from falling.

Overhead protection, consisting of planking heavy enough to stop any falling object. should be provided for scaffolds when men are working overhead. This protection should be not more than 9 ft. above the working platform.

Sidewalk bridges. Where construction or repair work is carried on over sidewalks, protection for pedestrian traffic is needed. Sidewalk bridges of adequate strength are provided by companies furnishing sectional steel scaffolding. * * *

Ladders

—From page 35

The front section should have level treads when in the open position.

The rungback stepladder permits a helper to assist from the back of the ladder.

A spreader or locking device of sufficient size and strength to hold front and back sections securely in the open position is important.

A bucket shelf is useful for many jobs. It should support a load of 25 lbs. and be fastened so that it can be folded up when the ladder is closed.

Platform (safety) ladders are a development of the stepladder. They provide a solid working platform guarded on three sides. They are particularly useful on jobs at fixed heights where the work requires considerable freedom for the worker.

Safety ladders are usually built for heavier duty than the ordinary stepladder.

Height to platform ranges from 3 to 18 ft., over-all height being 2 ft. more.

Single ladders up to the maximum length of 30 ft. specified by the Code are available. For sizes larger than 24 ft., extension ladders are easier to store and transport.

Sectional size of rails varies with the length of the ladder and diameter of rungs increases with the width of the ladder between side rails.

Diameter of rungs should be not less than 1⅛ in. Holes for rungs may extend through the side rails or be bored to give at least 13/16 in. of bearing to the rung tenon.

Oilers' ladders are provided with hooks at the top so the ladder may be securely fastened to overhead shafting.

Extension ladders. Two-section extension ladders up to 60 ft. in length are recognized by the Code. Specifications for dimensions of side rails and type of wood permitted vary with the length of the ladder.

Minimum overlap for ladders up to 36 ft. is 3 ft.; from 37 to 48 ft., 4 ft.; from 49 to 60 ft., 5 ft.

Smaller side rails on rung- type ladders are acceptable when reinforced by steel wire running the length of the side rails and securely fastened to them.

Locks must be positive in action. Guide irons must be securely attached to the ladder and so placed as to prevent the upper section from tipping or falling out while raising, lowering, or in use.

Rope and pulley for raising and lowering, while not mandatory, are desirable.

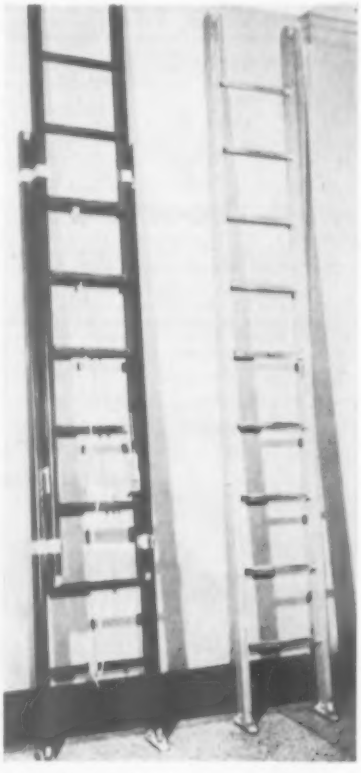
Trestle ladders of the "A" type (with a center section which slides up and down) are used in maintenance work. These ladders are commonly used in pairs with a stage between them or in sets of four with two stages and with planks from stage to stage.

Points to be considered in selecting extension trestles are guides of adequate length, strong locks of the sliding section, and a safety spreader.

Telescoping ladders are mounted on rubber-tired ball-bearing wheels with floor locks. Maximum height of working platform is 15 ft. When down, it will go through an ordinary door or into an elevator.

Telescoping towers reach still greater heights. These portable units can be extended up to 49 ft. The man on the platform controls the travel through an electric push-button system. Another push-button control is located on the frame below but the man above can lock the platform in place by pressing a safety button. Outriggers give stability.

Chain and rope ladders are for emergency use as a means of escape in case of fire or explosion,



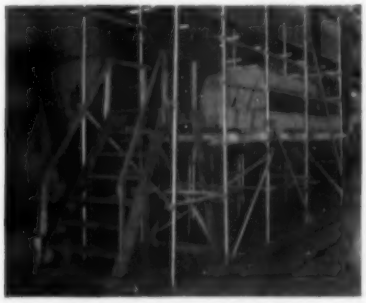
LIGHTWEIGHT single and extension ladders of new material—fiber glass reinforced plastic with a balsa wood core and aluminum or magnesium rungs. (Putnam Rolling Ladder Co. and American Cyanamid Co.)

For off-the-ground painting, cleaning, electrical work, window washing and inspection "Trouble Saver" Ⓗ Sectional Rolling Scaffolds offer efficient working space and maximum safety. "Trouble Saver" fixed or rolling Scaffolds are easily erected from interchangeable prefabricated 5'-wide frames and crossbraces plus guardrails. Rubber-tired casters have positive lock.

Versatile PS Co. Scaffolding simplifies plant maintenance while

Preventing Accidents and Reducing Costs

Painting, window washing and other light-duty work is fast and safe when done from this "Gold Medal" Ⓗ Midget Swinging Scaffold raised and lowered by a light, compact machine and ¼" steel wire rope.



Demountable stands of any size or shape for maintaining and servicing all types of plant equipment can be made from "TubeLox" Ⓗ tube and coupler Scaffolding. "TubeLox" consists of just four basic parts.

Ability to conform to odd shapes and uneven terrain and surfaces makes "TubeLox" Scaffolding valuable on difficult industrial maintenance jobs. It is extensively used by refineries.

Neat, strong, easy-to-get-at storage racks for tubing, pipe and bar stock are made from versatile "TubeLox" Scaffolding. Interlocking tubes and couplers form bays any height or width.

Non-slip platform and steps of new Aluminum Safety Platform Step Ladder give workmen maximum safety. Strong, lightweight channel aluminum construction. Heights 5' to 14'.

Write for free copy of "Controlling Costs", Bulletin G205R. Also, see the Yellow pages of your 'phone directory for the nearest Patent Scaffolding Co. office or representative that sells or rents "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. NSN, Long Island City 1, N. Y.

He'll Think Safety

every minute of his working day with

TEXEL Service

SAFETY SLOGAN TOWELS

TEXEL Shop Towels are imprinted with safety slogans he just *can't help reading* . . . while cleaning his hands, cleaning machinery, or engaged in general maintenance.

TEXEL all-cotton shop towels save plant owners at least $2.50 on each 100 pounds of rags purchased . . . because they need not be replaced as often as rags. (Better work—and more of it—than an equal amount of rags.)

Write for Sample and Name of the Texel Industrial Launderer In Your Area

INDUSTRIAL WIPING CLOTH CO., INC.
29-28 41st Ave.,
Long Island City 1, N. Y.

and for rescue work where rigid ladders cannot be used. These are not substitutes for permanent fire escapes.

Crow's nest ladders. For many outdoor maintenance jobs the "crow's nest" ladder mounted on a truck is used. It is an extension platform ladder, securely mounted on the vehicle, which can be rotated in a complete circle and elevated at angles from 45 to 72 degrees from the vertical.

This device permits working over parked vehicles and is used for tree trimming, servicing street lights, police and fire alarm signals, inspecting overhead lines, connecting house services, and general emergency work. It can be lowered into compact form for traveling.

Accessories

Ladder shoes. Whenever a portable ladder is used on anything but dry ground, there is possibility of the feet slipping. To overcome this hazard, several types of ladder shoes have been devised. They grip the surface by sharp points or by friction.

One type of sharp point is the metal spike; another is the abrasive shoe. The friction type depends upon frictional resistance for the gripping qualities of cork, lead, and rubber or neoprene with interwoven cord.

Another type made of cotton asbestos material and interwoven wire combines the two principles. Suction cups are used in still another type.

Ladder shoes become less effective through wear, especially when exposed to oil and grease on the floor. Consequently, they should be inspected regularly.

Stabilizers. When a ladder is used on an uneven surface, hydraulic stabilizers attached to the feet keep a ladder firm and steady. These can be attached to any straight or extension ladder.

Maintenance

Inspection. Look for: Loose rungs or steps; screws, bolts and other metal parts broken or missing; cracked or broken uprights, braces, steps or rungs; slivers; worn or damaged shoes.

Defective ladders should be marked and taken out of service until defects have been corrected. If beyond repair, they should be destroyed promptly.

Records of the condition of each ladder should be kept.

Storage. Ladders should not be stored where they will be exposed to weather, nor near radiators, stoves or steam pipes.

Protective Coatings

Two coats of linseed oil or spar varnish will increase resistance to weathering.

Painting is permitted by the ASA Code, if ladders are inspected before painting by experienced inspectors acting for the purchaser and ladders are not for resale. Transparent coatings, however, are preferred by many users.

Wood preservatives, which consist of toxic chemicals in non-aqueous solution, prolong the life of wood exposed to weather or in contact with the ground. They offer special protection at the joints or rung holes and tenons.

Preservatives of the NSP type (non-swelling, paintable) do not interfere with subsequent painting and varnishing.***

Housekeeping

—From page 31

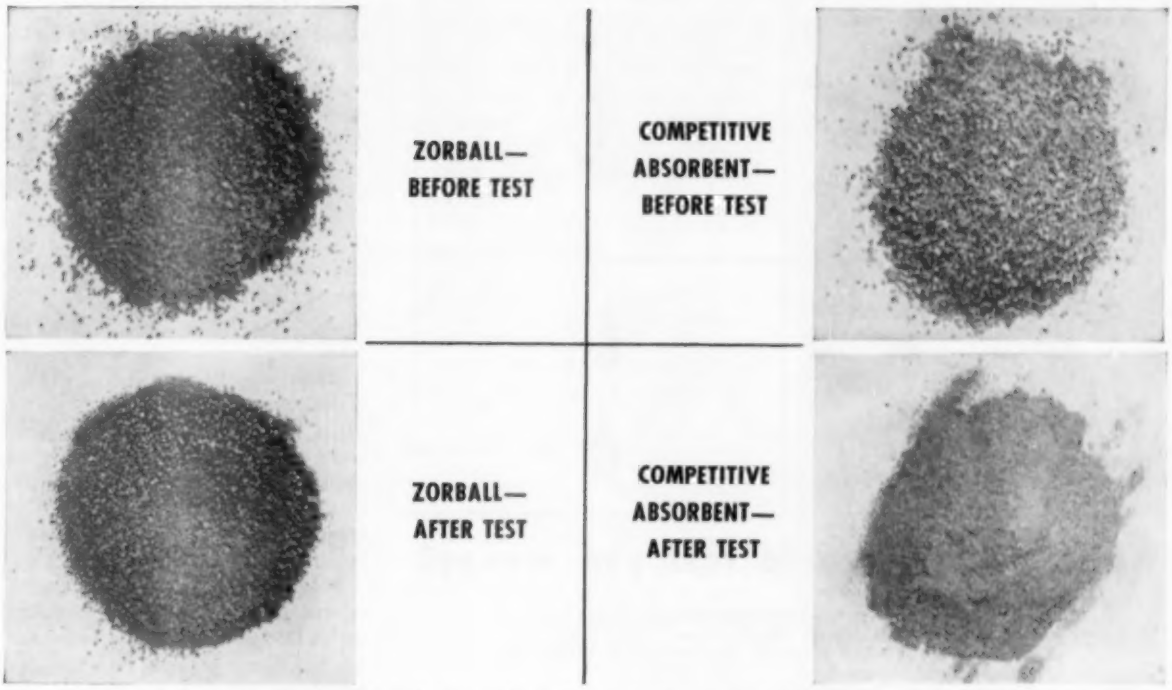
will train plant maintenance crews in cleaning methods.

Power sweepers are time and labor savers where large areas must be swept and the litter is relatively light. Some models are also used for sweeping up leaves and litter from the plant grounds and driveways.

Brooms, brushes, mops, etc. are needed in all plants to supplement mechanized equipment. Tools of good quality are more durable and efficient and they encourage better work.

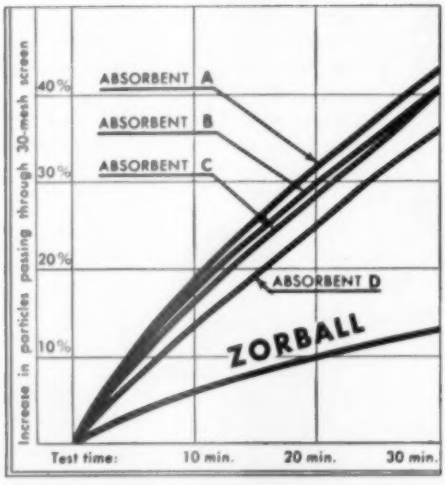
For dry sweeping, a wide cotton mop or a hair broom may be used. Oily mops may leave a dust-catching film.

Magnetic sweepers pick up ferrous chips, filings, nails and tacks from factory floors, drives and



Laboratory abrasion and crush test made on ZORBALL and competitive floor absorbent. *Top:* Both look very much alike when new. *Bottom:* But after 30-minute test, see the difference! ZORBALL is still granular, skidproof. Competitive absorbent is a powdered dust!

Crush tests prove Zorball Floor Absorbent resists breakdown longer, keeps floors safer!



Graph of abrasion-crush tests using ZORBALL and four other leading floor absorbents. Curved lines show rate of breakdown, prove ZORBALL stands up best under severe punishment!

Here's dramatic proof that Wyandotte ZORBALL is the safest, lowest use-cost floor absorbent you can buy . . . a laboratory test that duplicates the crushing that absorbents actually receive "on the job."

ZORBALL is safest, because its rugged, *angular* particles resist breakdown. ZORBALL is nonflammable; absorbs oil, grease, water, paint, ink, and chemicals. ZORBALL retains its anti-skid properties under heavy traffic or extremely wet conditions without mudding, caking, or dusting. ZORBALL lasts longer, goes farther, costs less to use!

For free sample and full data, clip and mail coupon. Do it today! *Wyandotte Chemicals Corporation, Wyandotte, Mich. Also Los Nietos, Calif. Offices in principal cities.*

Wyandotte Chemicals Corporation
Wyandotte, Michigan

☐ Send FREE sample and data on ZORBALL.

☐ Have representative call.

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Firm _____

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Wyandotte CHEMICALS
J. B. FORD DIVISION

walks, where such material might cause fire, explosion or personal injury. This type has a rotary non-electric magnet which is removed from the unit for clearing it of accumulated metal.

A larger power-driven model is used outdoors where large areas must be swept. These will remove nuts, bolts and other ferrous objects around hangars and on runways where they might be sucked into jet engines.

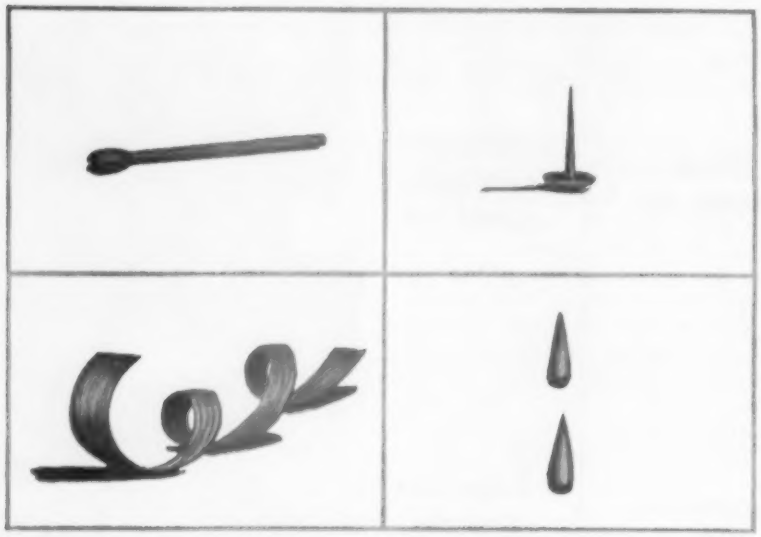
Aisle marking. Wide, clear aisles are signs of a well-kept plant. White lines are constant reminders to keep them free from obstruction and to pile stock within designated areas. Lines can be renewed quickly and economically with an aisle-marking machine.

Plastic film tape in white and colors is also used for marking aisles and storage areas. It is said to be durable and resistant to moisture and most chemicals used in industry. Lines can be changed and damaged parts replaced easily.

White has been adopted for highway traffic lines and is preferred for floor marking within the plant.

Trash containers at convenient locations throughout the plant help to keep litter off the floor. Containers with self-closing lids are best, particularly where oily rags and waste are stored. Containers may be painted a distinctive color to call attention to their presence.

SHOP TOWELS serve double purpose of wiping machinery and carrying safety slogans. (Industrial Wiping Cloth Co.)



Which of these could cost you money?

Any one of the above could become a hazard underfoot . . . resulting in a costly slip or fall. It doesn't take much . . . a wet surface, a small piece of wood or metal underfoot . . . and the damage is done.

Sure-foot PROTECTION IS ECONOMICAL . . . LONG-LASTING!

When you paint Sure-Foot on floors, stairs and manufactured products, you paint on protection . . . economically. One application covers. Sure-Foot is brush-applied like ordinary paint and comes ready for application right out of the can. It flows quickly and easily . . . dries overnight to a tough, hard, non-skid surface. Millions of carbide crystals give Sure-Foot its long-wearing abrasive quality . . . provide sure-footed, dependable traction under all conditions. Comes in five eye-easing colors . . . gray, red, black, traffic yellow and green.

EASY TO APPLY PAINT IT ON . . . INSIDE OR OUT!

PROVIDES PERFECT TRACTION ON WET OR DRY SURFACES

Sure-foot

non-slip abrasive floor coating

SURE-FOOT DISTRIBUTORS

Central Chemical Co. Dallas (1), Texas
Continental Safety Equip. Co. St. Paul 4, Minnesota
Coastal Plains Supply Co. Shreveport, Louisiana
Dayton Safety Supply Dayton 2, Ohio
Eastman Supply Co. Green Bay, Wisconsin
Guardian Safety Equip. Co. Philadelphia 4, Penna.
Guardian Safety Equip. Co. Tulsa 4, Oklahoma (Branch, Dallas, Texas)
Guardian Safety Equip. Co. Orange, New Jersey
Guardian Safety Equip. Co. Houston 2, Texas
Guardian Safety Equip. Co. Los Angeles 3, California
Guardian Safety Equip. Co. San Mateo, California
Guardian Safety Equip. Co. Atlanta 6, Georgia
L. P. Harless Co. Birmingham, Alabama
Safety Equip. & Supply Co. Fort Wayne 7, Indiana
Safety Incorporated St. Louis 3, Missouri
Safety Incorporated Kansas City 8, Missouri
Safety Supply Company Toronto 1, Ontario, Canada
Somer Filter and Todd Co. Pittsburgh, Pennsylvania
Standard Ind. Products Co. Peoria 5, Illinois
Universal Safety & Fire Equip. Co., Inc. Salt Lake City 11, Utah
V. E. Kennedy-Ingalls Co. Milwaukee 16, Wisconsin

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FREE—Write for Sure-Foot Bulletin 3-2

Section 2—Housekeeping and Maintenance

Leaves air mint fresh!

Mintol

the multi-purpose industrial disinfectant with the fresh mint leaf aroma

MINTOL disinfectant has a coefficient of 9. Diluted half a cup to the pail of water, it meets the new Use Dilution Confirmatory Test.

KILLS BACTERIA
SANITIZES THE SURFACE
DEODORIZES

For free sanitary survey of your premises ask your Dolge service man

Dependable DOLGE
WESTPORT, CONNECTICUT

★ The Positive Ladder Safety Device

Locks AUTOMATICALLY & instantly-holds

Prevents death and injuries from falling.

Automatic: Positive. Will catch workman if he starts to fall even if unconscious.
Inexpensive. Easy to install. No upkeep. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting.
Simple to operate: Requires no attention from climber.
Notched rail **hot dipped galvanized.** Entire equipment rust and corrosion proof.
Can be kept free of ice by applying heat inside carrier rail.
In use approx. 9 years. Approved by Safety Engineers and Govt. Agcys. throughout country. Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd., P.O. Box 1052
BURBANK, CALIFORNIA

Steam-cleaning units, which deliver jets of steam and cleaning solution under pressure, are used for cleaning some types of processing and fabricating equipment and removing stubborn deposits of dirt from floors, walls, and ceilings.

Both stationary and portable units are available.

Smoking areas are now provided in most plants. Receptacles which will not tip and spill their contents should be provided for cigaret butts and pipe ashes.

Janitors' Supplies

Development of more efficient cleaning materials has kept pace with improvements in mechanical cleaning equipment. Much research has gone into the development of cleaning methods. Manufacturers can furnish helpful data on housekeeping and maintenance.

Detergents. Basically, water does the cleaning. But water usually needs the aid of a detergent —soap, an alkali cleaning agent, or one of the newer synthetics. Soap is a detergent, but not all detergents are soaps.

There are three types of dirt: (1) Water soluble matter; (2) Oils and greases; (3) Inert solids.

A cleaner removes dirt by dissolving, emulsifying or suspending it.

Soap is one of the oldest cleaners and a most useful one. A serious defect is the formation of curds in hard water. Water softeners reduce the amount of soap required with hard water and increase its cleaning efficiency.

Synthetic detergents are derived from sources other than fats. Petroleum and coal-tar de-

JANITORS' AIDS

Vacuum cleaner—Heavy-duty with attachments
Floor machine—Size, type and attachment for the maintenance job
Brooms, brushes, mops, buckets
Cheesecloth
Rubber or neoprene gloves
Bowl and urinal swabs
Detergents—Soap or synthetic
Disinfectants and deodorants
Wax—Suitable for type of floor

SOL-SPEEDI-DRI.

green-flecked to tell you you've bought the best

"double S-d"—Sol-Speedi-Dri—is now green-flecked to tell you it's in a class by itself. "double S-d" was the first mineral oil and grease absorbent. It's the largest selling, because it is modern industry's greatest convenience.

New double S-d provides the most efficient floor coverage per pound, keeps plant floors clean and dry. Improved thirstiness and holding power, and the natural hardness and dustlessness of double S-d helps to reduce housekeeping costs and to increase production by keeping workers safely on the job.

When you order, be sure you check for the flecks—they're your identification of quality and value.

Get double S-d from your distributor today. Or check the coupon, attach to your letterhead and mail to SPEEDI-DRI DIVISION, Minerals & Chemicals Corp. of America, 2283 Essex Turnpike, Menlo Park, New Jersey.

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Are Washrooms in your building CLEAN and INVITING?

Here's Help!

A MANUAL OF PROPER METHODS FOR YOUR MAINTENANCE MEN

Gives simple methods of keeping washrooms cleaner and more inviting . . . fully illustrated . . . easy to follow. Outlines daily jobs, materials and equipment needed . . . also details weekly cleaning schedules. Tells how to clean porcelain, tile, concrete, marble safely. Organize work so less time is needed. Send for your copy today.

Free! *This new manual to help your maintenance staff keep washrooms clean with less effort.*

HUNTINGTON LABORATORIES
Huntington, Indiana

Send us a copy of your new Washroom Maintenance Manual without obligation.

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COMPANY
ADDRESS
CITY STATE

rivatives, and by-products of certain industries provide the raw materials. These cleaners are effective when used with hard water.

Alkalis such as washing soda, soluble silicates and various phosphates, form the third class of cleaning materials. Compounds of these are marketed under a variety of trade names. They are useful where sudsy cleaners are not desirable. They do not form a slippery film on floors.

Disinfectants and deodorants are useful, particularly for washrooms and garbage cans. They are not substitutes for detergents.

Odors may indicate either unsanitary conditions or merely a nuisance. The source should be removed if possible but a deodorant may be needed.

Floors

—*From page 28*

Cork tile is quiet and resilient and has high anti-slip and insulating ratings. In dry locations it stands up well under light traffic. It is expensive for most industrial uses but it will reduce damage to dropped tools and materials.

Abrasive metal plates are used for thresholds, elevator sills, stair treads and other locations where appearance and a durable, non-slip surface are essential. Plates with abrasive particles incorporated in the surface are available in both steel and non-ferrous metals.

Conductive floors of several types are important in the control of static electricity where explosives are manufactured or where flammable gases, dusts and vapors may form explosive mixtures. Conductive floors ground static electricity and stray currents.

Gratings are used for interior and exterior platforms, catwalks, stair treads, fire escapes, and over floor openings. They offer a sure footing and are practically self-cleaning.

Gratings in numerous designs are made in steel. Where light weight is essential, aluminum grating is available. • • •

UP! UP! UP! TO ANY DESIRED HEIGHT

EASILY . . . SAFELY . . . ECONOMICALLY

HI-LIFT EXTENSION SCAFFOLD

Models extend from 6 ft. 10 in. (can be made lower) to any desired height. Hand or electrically operated. Comes to you ready for work — no erection required, no loose parts. Built to meet individual requirements. Ideal for painting, lighting, cleaning, and all overhead maintenance. Pays for itself in time and labor saving.

Also Makers of
HI-LIFT PORTABLE WORK PLATFORM
and
ATLAS PORTABLE LOADING PLATFORM

Write for Complete Information

ATLAS INDUSTRIAL CORP.
866 39th Street
Brooklyn 32, N. Y.

Care of Floors

Floors of all types have longer life if properly cared for. A protective coating of some type is desirable.

Hardwood flooring in its natural state dries out and cracks and splinters under traffic. Scrubbing raises the grain of the wood and excessive moisture causes it to swell and warp. For protective coatings, sealers, enamels and varnish are used. Sealers penetrate the wood and produce a durable finish.

Concrete, while resistant to moisture, has a tendency to dust under traffic. This can be checked by treating with a sealer. If color is desired, a penetrating dye or a floor enamel may be used.

Linoleum, asphalt tile and rubber tile have an impervious and decorative surface. Care consists of cleaning and preserving this surface. As little water as possible should be used in cleaning.

Wax protects the surface and preserves appearance. It makes regular maintenance easier by keeping dirt on the surface instead of being ground into the floor.

Water emulsion (self-polishing) wax can be used safely on all types of floors. Buffing waxes contain solvents which injure asphalt and rubber. Either type may be used on vinyl floors.

Self-polishing waxes are considerably less slippery than buffing waxes. Tests have been made to determine the frictional resistance of various floor finishes on different types of floors. However, it has not been found possible to give any finish a rating which would apply for all surfaces and all conditions.

For floor scrubbing, the cleaner should do the work without leaving a slippery film. Soap is permissible for such surfaces as concrete, common brick, wood block and mastic. For marble and smooth tile a cleaning powder that does not leave a slippery residue should be used.

Strong alkalis and coarse abrasives are injurious to many types of floors, and usually milder cleaners will be effective.

Floor coating and finishing ma-

There's a BIG difference in floor absorbents

MAKE THIS DISCOVERY!

RIGHT IN YOUR OWN OFFICE you can test the difference of Eagle-Picher Industrial Floor-Dry with whatever oil absorbent you're now using. You'll discover it actually absorbs as much as 100% or more liquid per pound than other floor drying materials.

YOU'LL ALSO PROVE that Eagle-Picher Floor-Dry retains its skid-proof granular mineral form even when saturated. It doesn't mud or pack. Light in weight, it spreads easier and covers a larger area. Non-combustible, it has no chemical reaction. And possessing unusual reflective power, Floor-Dry makes working conditions bright and pleasant, as well as safe!

Since 1843 EAGLE EP PICHER

WRITE TODAY. Our Eagle-Picher representative will bring the portable laboratory to your office where you may make this test yourself. The Eagle-Picher Company, Cincinnati 1, Ohio.

YOU CAN'T MISS..
with CUSTANITE Flex-Flo® SAFETY HAMMER
guaranteed ...

. . . to outlast them all . . . for greater
SAFETY, ECONOMY and EFFICIENCY
REDUCES ACCIDENTS — LOWERS COSTS.
FIT THE JOB with choice of sixteen sizes,
Five Functioneered alloy hardnesses.

- **WON'T MUSHROOM**
- **WON'T SPARK**
- **WON'T FLY OFF**

Hollow-Head Design with exclusive "CONTROLLED COMPRESSION"
U.S. Pat. No. 2,704,094

SECURE-GRIP COATING
SLIPRUF®
Prevents that costly accident. Provides a firm traction surface for tool handles, etc. Better grip means safer work.
Recommended by Safety Engineers

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THAT'S ENOUGH YOU'RE USING
CAL-FLOR-DRY *NOW!*

CAL-FLOR-DRY is an EXTRA-PROCESSED
EXTRA EFFICIENT
EXTRA ECONOMICAL

ABSORBENT that cleans oils, (including soluble), greases and liquids, to keep floors, etc. inspection-clean, and safe for all employees from falling injuries and compensation.

Keeps clean and safe:
Floors, Stairs, Benches, Elevator Pits, Grease Racks.

Used consistently by:
Machine Shops Garages Mills Printing Plants
Bulk Oil Plants Stations Shops Warehouses Ship Yards

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THERE'S A WAREHOUSE STOCK Near You.
Write for Full Descriptive Literature.

The FLOR-DRY Company 1821 University Ave., St. Paul 4, Minn.

terials are listed by Underwriters' Laboratories (Accident Equipment List) in three classes. Materials listed have been found to have slip-resistance characteristics of not less than 0.5 as determined by the static friction test method of U. L.

I. Floor Treatment Materials (FTM)

1. Water-base materials.
2. Fillers, sealers, varnishes, and similar materials.
3. Detergents.
4. Abrasive-grit-bearing liquids.
5. Waxes, other than water base.
6. Sweeping compounds.

(The Gas and Oil Equipment List lists materials according to fire hazard classification.)

II. Oil and Grease Absorbents (OGA)

III. Walkway Construction Materials (WCM). Includes floor plates and stair treads made of:

1. Natural stone.
2. Composition.
3. Abrasive-grit-surfaced materials.

Oil Absorbents

Around machines where oil and grease accumulate, hazardous and unsightly conditions develop. Oil spills should be cleaned up promptly. Non-combustible absorbents keep floors cleaner and reduce slipping and fire hazards.

STREAMLINED POWER sweeper keeps even narrow aisles clean. Optional side-brush extends path from 28 to 40 in. (G. H. Tennant Co.)

PROMPT application of oil absorbent after a spill keeps floors clean and avoids tripping and fire hazards.

Absorbents are of two types—one for oils and greases; the other an all-purpose absorbent where water and other liquids are also present. They have a much greater absorbing capacity than sawdust, waste or rags, are non-combustible, and less bulky.

Absorbents are not subject to spontaneous heating unless the absorbed oil has that characteristic.

Oil-soaked garments, shoes, ropes and belts can be dry cleaned by burying in the compound.

Sweeping compounds keep down the dust from dry sweeping. These are listed by Underwriters' Laboratories (Gas and Oil Equipment List) in two groups: Class I, noncombustible; Class II, slow-burning. Tests include combustibility, behavior on heating, and spontaneous heating characteristics. * * *

Wiping Up Grease

Taking oil and grease off machine tools and dies and other wiping jobs may be done by paper wipers, industrial wiping towels, and waste or salvaged rags.

Either of the first two methods is more likely to promote good housekeeping. Paper wipers are collected and burned at the end of the day, reducing the fire hazard. Convenient receptacles are needed. The paper is highly absorbent and has enough wet strength for use with solvents.

Wiping towels of sturdy cotton cloth are absorbent and offer some protection to the hands where work is done around metal chips and turnings or on rough surfaces. Cloth towels are furnished by industrial laundries.

With salvaged rags and waste, men sometimes keep partly used rags behind benches, in corners and under machines, creating a housekeeping problem and a fire hazard. Safe metal containers should be provided and their use required.

Color

—From page 32

shipping containers) on which the name of the contents should be stenciled; lights at barricades and danger signs; emergency stops on machines such as rubber mills, wire blocks and flat work ironers, and emergency stop buttons for electrical switches.

Yellow has high visibility, suitable for marking hazards that may

3 MAJOR FLOOR MAINTENANCE BENEFITS IN 1 DRESSING...

1. EXCELLENT SLIP RESISTANCE

Readings obtained on the Underwriters' Laboratories' James Machine prove that Poly-Glo rates "excellent" on all floor surfaces tested.

2. LABOR-SAVING EASE OF APPLICATION

Poly-Glo applies easily, dries in minutes to a tough, glossy film. It resists heel marking, dirt and water and will not yellow or discolor the lightest floors.

3. SPARKLING BEAUTY WITHOUT BUFFING

Self-polishing Poly-Glo gives sparkling beauty without machine buffing. Damp mopping with cold water whisks off clinging dirt, will not remove Poly-Glo's protective film or lustre.

USE POLY-GLO ... safely on all types of resilient, non-resilient and sealed wood floors!

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result in slipping, falling and bumping into objects. Solid yellow and stripes and checks of yellow and black, may be used to attract special attention. Top and bottom treads of stairways, low beams and pipes, and crane hooks are places where yellow may be used.

Black and yellow stripes often are used on mobile equipment, such as tractors and industrial locomotives.

Green in combinations with white, such as a green cross on a white background, designates location of first-aid and safety equipment. Location of stretchers, gas masks, and bulletin boards is identified by this color.

Black and white, in stripes or checks, are used for housekeeping and traffic markings.

Orange has high attention value. It is the basic color for marking dangerous parts of machines or energized equipment. It emphasizes such hazards when enclosure doors are open, or when gear, belt or other guards around moving equipment are open or removed, exposing unguarded hazards.

Blue is for warnings, such as painted barriers or flags. These should be located conspicuously at the starting point or power source of machinery.

Purple is the basic color for designating radiation hazards. Yellow should be used with purple for tags, labels, signs and floor markers.

Identification of Piping

Five basic colors for identification of the contents of pipes are specified in ASA Code, *Scheme for Identification of Piping Systems,* A13.1-1956. Identification may be provided by stenciled legends, decalcomanias, self-adhesive tape or painted stripes.

Basic identifying colors are:

F. Fire protection—red.

D. Dangerous materials — yellow or orange.

S. Safe materials—green or achromatic colors (white, black, gray, aluminum).

P. Protective materials—bright blue.

PAINT REFLECTION VALUES
(Per cent)

White	88
Ivory	69
Cream	67
Sky blue	65
Pale green	59
Buff	52
Aluminum	41

Above values are only approximate since colors vary with different paint manufacturers.

Color may be applied the entire length of the pipe or in bands 8-10 in. wide near valves and pumps, and at intervals along the line. The name of the specific material is stenciled in black at conspicuous locations at valves, pumps and similar places.

Color stripes painted at the edges of the color bands also may be used to identify the exact contents of lines, but this is less satisfactory than stenciled identifications. Labels which conform in color and size of letter to the code, are on the market.

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Always Flat at Any Angle

Standard Equipment in
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Section 2—Housekeeping and Maintenance

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For bulletin and color card, write your local distributor or:
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1445 S. 15th St. Louisville 10, Ky.

Acids and alkalis cause some paints to change color. Paints resistant to moisture and chemical action should be used.

Paints

Paints, enamels and lacquers provide a medium for the application of color. Industrial finishes often are subject to severe exposures; paint has been developed for special needs.

Floor coatings. Synthetic enamels and rubber base floor coatings give better service on concrete than ordinary floor enamels and are more resistant to moisture, acids and alkalis.

Light-colored floors conserve light. They may be stippled with darker colors to avoid glaring contrasts.

A painted concrete floor often seems more resilient underfoot than bare concrete. The thin film of paint may help physically but the psychological effect is probably more important.

Water-thinned paints. Cold water paints (synthetic resin and rubber base types) are satisfactory for some industrial interiors. They can be applied with spray-coating equipment, and are washable and serviceable where not exposed to weather and dampness.

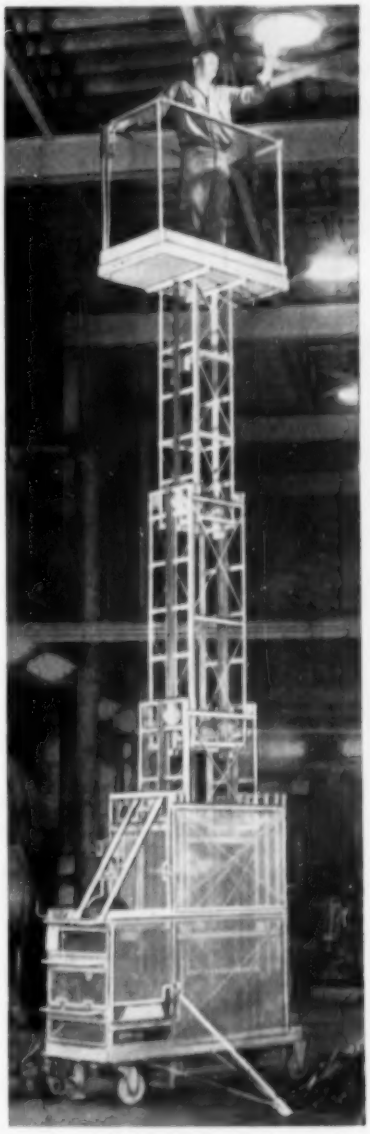
Rubber base paints are more durable and will stand considerable washing.

Luminescent Materials

Some types of paint, tape and plastics become luminous in complete darkness after exposure to natural or artificial light.

Fluorescent materials glow only while exposed to ultraviolet light. There is no usable afterglow. They are used where desirable for the eyes to adapt to darkness, as in instrument dials, night flying and driving, and where electric power is available for producing light. They enable the operator to observe readings without glare or eye fatigue.

Phosphorescent materials glow after exposure to light and remain luminous after the light is extinguished. They are observed best under total or near-total



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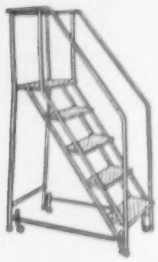
For Filing Rooms — Stock Rooms — Vaults



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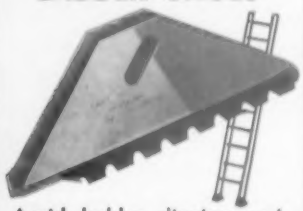

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darkness. The glow is of low intensity, suitable only for close viewing in darkness.

Reflecting coatings or buttons are effective where light from headlights, flashlights, cap lamps and similar sources is available.

Rust prevention. Paints which form a tight bond with clean metal offer protection against rust and corrosion. Where rust has started, ordinary paint is ineffective because corrosion continues under the paint film. Rust-sealing coatings, both clear and pigmented, often are helpful. * * *

Light

—*From page 19*

and the adjacent areas, provide sufficient light for safety and for ordinary visual needs.

For general overhead lighting, levels range from 5 footcandles for inactive storage and passageways to 50 footcandles for more exacting work.

Where higher levels are needed, supplementary units provide the necessary light more economically.

Maintenance. To insure adequate levels, even where conditions are favorable, the system should be designed to give initially at least 25 per cent more light than the recommended minimum.

Where dirt collects rapidly and systematic maintenance is not provided, the initial value should be 50 per cent above the minimum.

Supplementary lighting. Difficult seeing tasks require more light than can be obtained economically by overhead general lighting. For such work supplementary fixtures are used.

Two types of equipment meet most needs. One uses small concentrating projectors to increase the light on the work and provide directional quality.

Another type has large area with low brightness, such as fluorescent desk or bench lamps. These fixtures can provide either general lighting for a small area or extra light for critical work, such as inspection.

Supplementary lamps should be shielded, louvered or mounted to prevent glare.

Artificial Light Sources

Industry's three major light sources are fluorescent, mercury vapor and incandescent. Each type has its advantages. In modern practice, they frequently are combined to meet special lighting situations.

Fluorescent lighting is used widely in all types of plants at low and medium heights, also for high bay mounting over large areas.

Mercury vapor lighting is largely used where medium to high-bay lighting is needed in comparatively narrow room areas.

Incandescent lighting, with appropriate fixtures, may be used at any mounting height.

Fluorescent and incandescent lamps are used for supplementary bench and machine lighting.

Comparative efficiency. The efficiency of any light source is the ratio of light produced in lumens to power consumed in watts.

The fluorescent lamp, generally speaking, provides more than 3 times the light per watt of an incandescent lamp. It lasts approximately 7 times as long.

The mercury vapor lamp produces more than 2½ times the light per watt of an incandescent bulb and lasts more than 5 times as long.

An incandescent lamp can be used with any standard socket.

BRIGHTNESS RATIOS
(Industrial Engineering Society)

Between tasks and adjacent surroundings	5 to 1
Between tasks and more remote surfaces	20 to 1
Between luminaires (or sky) and surfaces adjacent to them	40 to 1
Anywhere within the environment of the worker	80 to 1

NOTE: These ratios are recommended as maximums; reductions are generally beneficial. Color and reflections of walls, ceiling and floor, as well as of equipment, determine brightness pattern.

Fluorescent and mercury vapor lamps need auxiliary ballast equipment. The wattage used by auxiliary equipment must be added to that consumed by the lamp to obtain the over-all wattage efficiency figure.

The fluorescent lamp excels in both efficiency and quality of light. In contrast to the more brilliant "point" light sources provided by incandescent and mercury vapor, fluorescent lamps produce light in long, luminous tubes. These diffuse light over a wider area, make for more comfortable seeing and reduce glare and shadows to a minimum.

The fluorescent lamp produces three times the visible light but only half the radiant heat of the incandescent lamp. This cooler light helps reduce the cost of air conditioning.

Fluorescent lamps are offered in several shades of white light to meet specific lighting requirements.

Mercury vapor gives a greater volume of concentrated light per fixture. This makes it ideal for high-bay installation.

Excellent seeing is another advantage. The blue-white hue is well suited to the blacks, grays and whites of many industrial operations. Long life is another feature—averaging more than a year on typical two-shift operations. Mercury vapor provides a compact, controllable light source which performs well in all temperatures. It is simple to maintain and has a wide variety of applications.

The basic color of the light can be modified by using color improved mercury lamps or by combining with mercury or incandescent lighting.

The mercury-fluorescent combination is effective in medium-high bays which are easy to service and free from excessive dirt. It is recommended that mercury supply 60 to 80 per cent of the total light. Fluorescent will soften glaring contrasts.

In high bays twin units for mercury and incandescent can be installed. The mercury provides 50 to 65 per cent of the light. This combination is simple to maintain, offers little surface for dirt accumulation. It provides instant relighting after power interruption, when mercury lamps take 5-8 minutes to relight.

Incandescent offers low initial cost. No auxiliary equipment is needed and an incandescent system is easy to install, maintain and relamp. However, lower efficiency makes over-all cost of lighting higher.

Incandescent provides a "point" source of light. It can be controlled more easily but is more likely to produce glare and shadows. In industrial practice incandescent is becoming less popular for general lighting. It is used largely for specialized supplementary lighting.

Efficient operation requires frequent checking to prevent voltage variation. If circuit voltage is lower than rated lamp voltage, light output and watts decrease, though life lengthens. If voltage is higher, light output and watts increase but life is shortened.

Voltage variation should be held within 3 volts of rated lamp voltage for 110-125-v. lamps and within 6 volts for 220-250-v. lamps.

REFLECTANCE VALUES

	Reflectance Factor (%)
Ceilings	80
Walls	60
Desks and bench tops	35
Machines and equipment	25 to 30
Floor..not less than	15

Reflectors. Many types of reflectors are available to conserve light and prevent glare. In choosing the lighting unit consider:

—Distribution of light on the job.
—Efficiency of light output.
—Sturdiness of construction.
—Adaptability if more light is needed.
—Economy of cleaning and replacement.

Lamps with a reflecting surface inside the bulb have important advantages where dust, fumes, and other conditions make main-

Make your plant safer with "SAFETY-WALK"

Here's the new mineral-coated fabric that provides perfect traction—sure footing—even under *water or grease!* Patterned in strips, tiles and cleats for a variety of purposes, it goes on in minutes—lasts for years. And it's easy to keep clean! Use "Safety-Walk" Non-slip Surfacing on stairs, walkways, ramps—wherever the danger of a fall is present. "Safety-Walk" pays off in accident prevention, better public and employee relations . . . prevents costly claims.

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tenance difficult or costly. The reflecting surface is sealed against deterioration and light is diffused through the bottom of the lamp.

Reflectorized lamps are available in both filament and mercury vapor types.

Natural Light

A plant may be designed to make full use of daylight or to depend largely or wholly on artificial light. The problem is primarily one of economics, taking into consideration the number of sunny days and the increased cost of construction to bring daylight into the plant.

Sawtooth roofs, oriented to avoid direct sunlight, offer the most effective way of daylighting a one-story building. Extra cost as compared with a flat roof, may amount to 20 per cent or more.

Side windows alone are unsatisfactory for lighting extensive areas. Skylights are rather expensive to keep in repair and clean. They have obvious disadvantages in regions where hailstorms are frequent.

Refracting and **diffusing** glass are helpful in subduing glare. They improve distribution of light, particularly to distant parts of the room.

Translucent coatings for windows on the sunny side of buildings also help in reducing glare.

Reflection of daylight from sources outside a building can often be utilized. Light colors for faces of structures, walls of courts, and sawtooth roofs are helpful. These surfaces should be kept clean and free from sources of glare.

Sudden transition from bright to dim areas in a plant is hazardous. While the pupil of the eye is adjusting itself to the dimmer light there is a period of semi-blindness. Gradations of light at the approaches to areas of different intensity will avoid this trouble.

Photoelectric cells can maintain an even level of light, turning on artificial lighting when illumination falls below a specified number of footcandles.

Special Fixtures

Where lighting equipment is required for special uses or subjected to abnormal conditions, many types of lamps and fixtures are available.

Glow lamps are used as signal, pilot and night lights. They are not practical for general illumination.

Shock-resisting lamps are especially constructed to withstand shocks and bumps. They are used chiefly with portable fixtures on extension cords.

Vibration lamps have a more flexible tungsten filament and special support. Since vibration and shock frequently occur together, testing both lamps will tell which gives longer service.

—*To page 170*

New
DRY TAMP
PERMA Mix Floor Patch
Don't stop traffic to repair floors—use Permamix, the new all-temperature DRY TAMP floor patch.
DRY TAMP MEANS SPEED • No sticky mass to dig out of the drum or to handle • Permamix dry pours • sets instantly • feather edges perfectly • no production delays • non-skid surface.
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IN THIS SECTION

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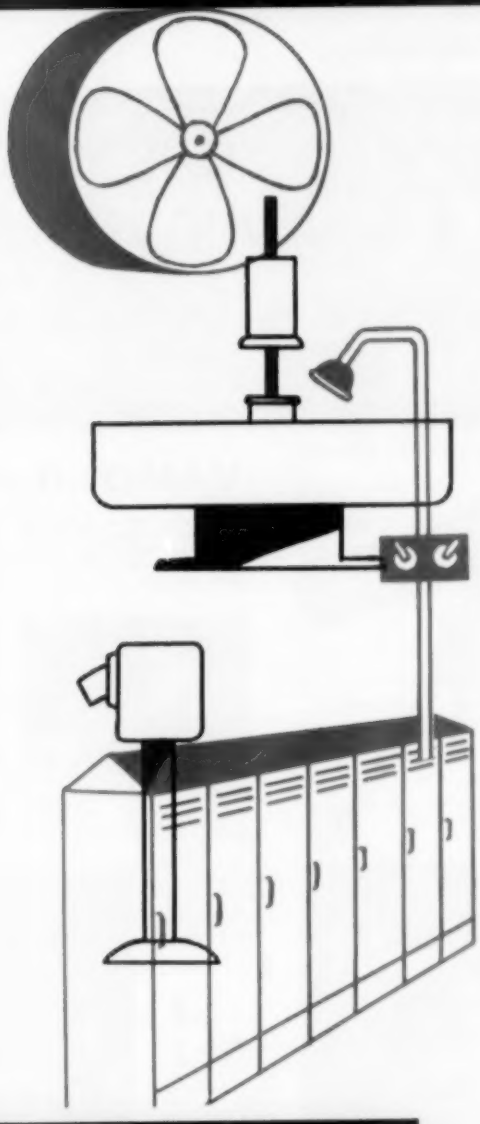
Washrooms and Lockers ... 57
Skin Infections 58
Safety with Solvents 60
Heat and Humidity 62
Drinking Water 66
Food Service 71
Radioactive Materials 73

• • •

INDUSTRIAL HEALTH ENGINEERING has been described as a combination of sanitary, chemical and mechanical engineering. This new science got its start soon after World War I to meet the challenge of increasing occupational hygiene problems.

New materials and new processes have brought an increasing variety of exposures—some suspicious and some definitely harmful. These exposures involve dusts, gases, vapors and other air contaminants, extremes of temperature, radiation and noise. Research in occupational hygiene has been stimulated by the extension of compensation to cover diseases attributed to these exposures.

Health engineering includes employee services, such as sanitary facilities, prevention of skin infections, food service and drinking water.



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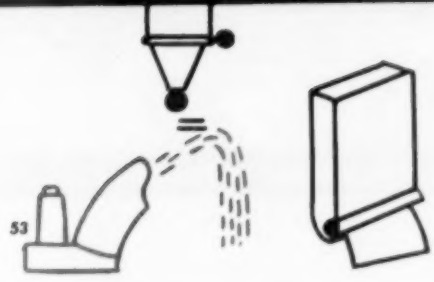
INDUSTRIAL HEALTH ENGINEERING



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Vano Design "A" cooling interior of furnace, supplying fresh air through 10 feet of "Ventube" to provide safety and comfort during repair work.

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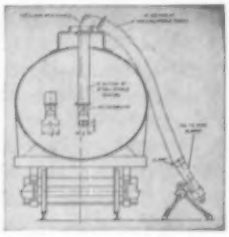
Vano Design "A" Ventilator plus a few accessories feeds large air volume into tank car, driving out fumes, stagnant or hot air for workers' safety and comfort.



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Vano Design "A" Ventilator supplying fresh air to men working in wing compartments, fuselages, etc.

Powered by a ½hp motor, and equipped with the exclusive Coppus axial-flow propeller-type fan, this general-purpose blower delivers 1500 CFM of fresh air. It supplies ventilation for tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments and fuselages, and other confined places. Weighs only 103 lbs. Uses 8"-diameter flexible canvas tubing ("Ventube").

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VENTILATOR-EXHAUSTER

Vano Design "C" equipped with 8" discharge tubing removing welding fumes.

Vano Design "C" equipped with two suction lines removing welding fumes for operators' safety.

For withdrawing welding fumes from confined places or directly from the welding rod ...or for expelling fumes or hot air from enclosed vessels. You can get it with 8" suction inlet for 8" non-collapsible tubing ...or with multiple inlet nozzles for 5", 4" or 3" suction hose. The discharge outlet takes 8" "Ventube". Powered by a ½ hp motor, it weighs only 85 lbs.

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Please send information on the Blowers that clear the air for Action.

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Industrial Ventilation

Providing fresh air for the workplace

VENTILATION, reduced to its simplest terms, means providing clean air for the health and comfort of occupants of an enclosed space. That may involve anything from an open window to elaborate exhaust systems and controlling heat and humidity.

Providing the air requirements of the workplace may be complicated by nuisance or toxic air contaminants generated in the industrial processes.

Ventilation problems frequently involve the community as well as the plant buildings. In many areas, gases, dusts and by-products of combustion cannot be vented to the outside without treatment to make them safe and unobjectionable. Prevention of air pollution is receiving much attention from industry and from public health organizations.

A workplace can be ventilated by either natural or artificial means. Natural ventilation—air circulation through openings in walls unassisted by mechanical equipment—is seldom entirely satisfactory.

Ventilating systems are based on one of two general principles or a combination of the two:

—**Plenum ventilation.** Air is driven into the room by fans, diluting the room air with fresh air, forcing out stale air through doors, windows, cracks and crevices. This method has definite limitations.

—**Exhaust (vacuum) systems.** Air is drawn from a room by fans. Air to replace it enters the room through doors, windows and other openings because of reduced air pressure in the room.

General Ventilation

Where processes are not injurious to health, general ventilation is usually satisfactory. It is also satisfactory where dilution of air contaminants will keep the concentration below permissible limits for continuous exposure.

Where toxic materials are handled, removal of contaminants at their source is necessary.

Ventilation is often complicated by the necessity of maintaining a comfortable temperature. Exhausting impure air is usually practicable but in cold weather it may be difficult and expensive to warm large volumes of incoming air.

Natural ventilation is adequate for some buildings housing nonhazardous operations. Air circulation is aided by doors, windows, roof ventilators and monitors. The number of outlets should be planned for hot weather when the temperature difference inducing the draft is at the lowest point.

Air intakes should be located so that incoming air is properly tempered and does not cause uncomfortable drafts in cold weather.

Artificial general ventilation requires properly located inlets and outlets. Air coming into the room must be uncontaminated and discharge points should be located to avoid recirculation.

When the contaminant is heavier than air, openings at floor level permit its escape.

Fans and blowers. Both portable and stationary types are useful for increasing circulation of air which affords relief from heat.

CHECKING on the exhaust system. Using portable dust catcher, industrial hygienist collects dust sample from atmosphere where silica is used for making molds. (Westinghouse)

They are not substitutes for exhaust ventilation where air contaminants should be removed.

For moving large volumes of air blowing is more efficient than suction.

Devices for air circulation become less effective as temperature and humidity rise.

Caution should be used in air movement, particularly with velocities over 200 fpm. When relatively cool air is blown over workers at high velocity objectionable drafts are created.

Dust and Gas

Dust is usually more difficult to control than gases, vapors, mists and fumes. Dusty operations tend to project particles so that the hood must provide velocities sufficient to draw them into the exhaust system.

Exhaust hoods should enclose the process as completely as possible or the hood should be located to take advantage of the directional effects of the dust flow.

Dust-removal systems generally require higher air velocities and ducts of heavier gauge metal than those designed for gases.

Control Measures

Where there is a definite source of air contamination, general ventilation alone is seldom sufficient. Control involves three steps:

—Identifying the substance and locating its source.

—Atmospheric sampling to determine nature and extent of contamination.

—Engineering control measures.

Control at the source may involve one or more of these measures:

—Isolation or enclosure of the hazardous operation.

—Local exhaust ventilation.

—Operational changes involving substitution of process or materials.

Isolation confines the operation to a definite location. Exposure of workers is either eliminated or restricted to a few selected, trained and equipped operators.

Examples of installations which combine exhaust ventilation with isolation and enclosure are: sandblasting rooms, shakeout and tum-

bling-barrel operations in foundries, dry mixing, and mixing of volatile liquids.

Processes creating excessive heat, humidity or noise should also be isolated wherever possible.

Local Exhaust Systems

Local exhaust systems are an important means of occupational disease control. Their purpose is to create a sufficient movement of air to withdraw contaminants at point of origin and convey them to a safe point for disposal.

An exhaust system consists of four major parts:

—Hoods or enclosures near source of contaminant.
—Piping to connect hoods into system.
—Collection equipment.
—Fan.

Each part has its independent function but all must be designed to work together efficiently.

The exhaust hood is the most important part of the system. It should enclose the process as completely as possible. Air velocity decreases approximately with the square of the distance from the hood opening.

Air velocity for effective control varies with the process and material exhausted. Generally speaking, the better the enclosure and design of the hood, the lower the velocity needed.

Hoods or enclosures may be in the form of booths, canopies, lateral hoods, downdrafts through grill openings below the process, or slot-type hoods. The object is to remove the contaminant without drawing it through the breathing zone of the operators and with minimum interference with processing.

Hoods can be made more efficient by addition of flanges.

Ducts connect the hoods to the central fan, distribute the air flow in direct proportion to the requirements of each inlet, and maintain adequate pipe velocity to convey the contaminant to the point of discharge.

The system should be balanced so that each hood draws the proper amount of air. When this condition has been obtained, all means of adjustment should be permanently fixed. Areas of branch pipes and main ducts can be calculated to give correct air velocities throughout the system.

Material used for ducts must resist abrasive action of dust or corrosive effects of gases and vapors.

Sharp turns in ducts should be avoided. They take extra power and cause a large pressure drop.

Traps with clean-out gates should be provided at the bottom of vertical runs, and clean-out gates at regular intervals on the bottom side of horizontal runs.

Fans should have a capacity slightly higher than calculated requirements to allow for leakage in the system, accumulation of material on fan blades, and similar difficulties.

Where the contaminant is hot and has a natural tendency to rise and the operation can be provided with an effective enclosure type hood, natural draft ventilation is often satisfactory.

Portable ventilators are used for supplying fresh air to confined spaces for many temporary jobs. Examples are tanks, tank cars, vats, underground cable manholes, pipe galleries, ship holds,

—*To page 75*

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LIMITS FOR VARIABLES INFLUENCING COMFORT AND SAFETY

(Ross A. McFarland in *Mechanical Engineering*, May 1954)

Variable	Desirable	Max or min value
Ventilation	Sufficient additional fresh or recirculated odor-free air to remove all odors	20 cfm of fresh air
Air Temperature.	Ambient temperature adjusted to give effective temperature of 63–71 ET (winter) or 66–75 ET (summer)	70–72 F dry bulb
Air Velocity	Adjusted to ambient temperature to give appropriate cooling power without drafts	40–60 fpm
Humidity	Adjusted to air temperature and velocity to maintain comfort	25–50% relative humidity
Carbon Dioxide ..	Not a requirement as long as ventilating requirements for removal of odors are met	0.5–1.0%
Carbon Monoxide	None	0.003%
Noise	Conversation at least 3 ft with no extra effort	80–85 db over all; 50–60 db in 1200–2400 band
Vibration	Below threshold of perception	0.002 in. at 20 cps or more

Washrooms and Lockers

Essentials for cleanliness, health and comfort

WELL-EQUIPPED washrooms, toilets and lockers, kept clean and attractive, have a strong appeal to desirable workers and help to keep them healthy and happy on the job.

Adequate facilities for personal cleanliness and hygiene can be installed most economically when a building is constructed. Attention to these requirements in the planning stage will insure sufficient space and convenient location. Otherwise facilities may have to be fitted later into less convenient space and at higher cost.

Have facilities kept pace with plant expansion? A survey of present equipment will show whether additions are needed.

Also, equipment should be checked against modern standards of sanitation and appearance.

Location. Good planning minimizes loss of employee time between job and washroom.

Lockers, lavatories and toilets may be in one central location or scattered through the plant, depending on its size, layout of departments and type of operations.

In smaller plants, washrooms and lockers are usually near the entrance.

Toilets should not be more than 200 ft. away from any work place. In multi-story buildings, one on each floor is desirable. If that is not practicable, they should not be more than one floor above or below the work place.

Washrooms in large one-story buildings usually are scattered throughout the building. Where there are many small isolated buildings, as in chemical plants and railroad yards, or where much of the activity is outdoors, a separate building may house all these facilities.

Accommodations should be located so that employees will not have to cross highways or railroad tracks to reach them.

When lockers and washrooms of a large plant are near the main entrance, small rooms with lavatories and toilets are often scattered through the plant. This saves workers' time and makes it possible to close the main room during working hours, lessening danger of theft and requiring less supervision.

Separate washrooms and lockers are desirable for departments with exposure to excessive dust, dirt, heat, vapors, or moisture. These need more lavatories or shower baths than cleaner departments.

Offsetting the advantages of scattered facilities is the higher cost of installation and maintenance. Centralized toilet and washing facilities are often preferable where women are employed. In some plants a full-time attendant may be needed.

In some large plants with underground passageways, connecting buildings and departments, personal service facilities are often located along them, conserving space for manufacturing operations. Another space-saving method is to locate them on balconies.

Light. Fixtures should provide sufficient light in all parts of the room. Walls, ceilings and partitions in white or light colors conserve light and encourage cleanliness.

Ventilation. Unless the washroom has sufficient outside windows for natural ventilation, forced ventilation will be needed.

Floors, and walls to a height of at least 6 in., should be of impervious material, such as glazed tile or concrete with good friction characteristics.

Walls should form a tight joint at the floor level, or there should be a cove base at least 6 in. high. Walls should be impervious to water to a height of at least 5 ft. Wall and ceiling surfaces should be washable.

MODERN WASHROOMS are easy to keep clean. Washfountains with soap dispensers, concrete floors, tiled walls and lockers on cove bases are features of this one. (Diamond Alkali Co.)

Wash Fixtures

Group washing equipment. In industrial plants, institutions, schools and other establishments where facilities must be provided for large groups, circular wash fountains are the most frequent choice.

Eight to 10 users can be accommodated at a 54-in. circular fountain and 5 to 6 at a 36-in. unit. Fewer valves and plumbing con-

—*To page 120*

Skin Infections

A widespread and perplexing problem

SKIN INFECTIONS are a problem in every industry. Even substances normally harmless will cause irritations of varying severity in some skins. These ailments have been blamed for some 60 per cent of all compensation claims for occupational diseases.

While rarely a direct cause of death, these infections cause much discomfort and are often hard to cure. The patient may also develop a difficult mental state.

Skin irritants are classified under 5 main heads:

1. *Mechanical agents*—friction, pressure, trauma.
2. *Physical agents*—heat, cold, radiation.
3. *Chemical agents*—organic and inorganic, subdivided according to their action on the skin as primary irritants and sensitizers.
4. *Plant poisons*—several hundred plants and woods can cause dermatitis; best known is poison ivy.
5. *Biological agents*—bacterial, fungous, parasitic.

Types of Infection

There are two general types of skin infections:

1. Primary irritation dermatitis. Practically all persons suffer skin irritations from acids, alkalis, irritant gases and vapors, and from physical agents such as heat, cold and friction. Brief contact with a concentrated primary irritant or prolonged exposure to a lower concentration results in inflammation.

Allergy is not a factor in these conditions.

2. Sensitization dermatitis is the result of skin sensitivity to a given substance. This form requires a definite period of sensitization. During this period the offending substance causes no response unless there is contact with concentrations high enough to cause primary irritation.

Once sensitization develops, even small amounts of the material may cause symptoms.

Some substances can produce both types of dermatitis. Among them are organic solvents, formaldehyde and chromic acid.

Cutting Oils

Cutting oils and compounds are frequently involved where cutting and turning of metals is performed. The condition starts with irritation of the skin by continuous contact with the oil, forming comedones or blackheads. These comedones later become infected to form oil pimples or boils.

Dirty workers working in dirty oil form a combination that often results in serious conditions. Some types of skin are more susceptible than others, but anyone will develop the condition with sufficient exposure.

If other precautions are taken, use of protective creams will help, primarily by making it easier to cleanse the skin.

Keep machines and the area around them free from loose oil.

Oil should be changed and the machine thoroughly cleaned after each 120 hours of use, or oftener. Oil may be reclaimed or replaced, depending on which is cheaper.

If reclaimed, it may be sterilized by heat during the process. Caution should be used in adding germicides to oil. Most of them are irritating in excessive amounts.

Oil dermatitis occurs most often on the front of the thighs and the back of the neck, where clothing rubs, also on forearms and wrists where direct contamination is heaviest. Men working in the area must keep clean and not wear oil-soaked clothing.

Men should be encouraged to bathe at the end of the shift. A shower with warm water, mild soap or detergent, and a soft brush is helpful in the control of skin infections.

Predisposing factors. In investigating causes of skin disorders, the following should be considered:

1. Race of patient.
2. Type of skin.
3. Age.
4. Sex.
5. Degree of perspiration.
6. Personal habits of cleanliness.
7. Pre-existence of skin disorders and allergic states.
8. Diet.

General Precautions

Prevent or reduce contact with known irritants wherever possible. Use of enclosure or mechanical methods of handling will reduce skin contacts.

Watch housekeeping around processes.

Provide personal protective equipment—gloves, aprons, face shields, protective creams, etc.

Encourage personal cleanliness which shortens contact of irritants with the skin.

Select a cleanser which can be used by most persons. Some sensitive skins may require special cleansers. * * *

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Safety with Solvents

INDUSTRY uses vast quantities of organic solvents in its processes, and practically all of them are flammable or toxic or both in varying degrees. The problem, then, is to select the solvent that will do the job with the least hazard to personnel and property and surround its use with all possible safeguards.

The safeguards include ventilation, personal protective equipment, fire protection, facilities for personal cleanliness, and medical supervision.

Solvents are used in various manufacturing processes to dissolve pigments, glues, plastics and other materials. Another widespread use is to dissolve soil in cleaning equipment.

Animal and vegetable fats are readily dissolved by alkalis which combine with the fats to form soap, which is washed away with water.

A common type of soil combines dust, tars and gums which are most easily dissolved by organic solvents.

Emulsion cleaners have to be used with water, which limits their use. Straight solvents are needed where water cannot be used, as on electrical equipment.

Organic solvents are those which contain the element carbon, and no metallic or basic element. They are classified in four main groups:

1. Hydrocarbons
2. Alcohols
3. Esters and ketones
4. Chlorinated solvents

In addition to solvent power, other properties of a solvent may be important to the user. Flash point, toxicity, speed of evaporation and cost may be even more important.

Properties of Solvents

From the standpoint of safety the two most important properties are the flash point and the maximum allowable concentration.

The flash point of a volatile liquid is the ignition temperature of its saturated vapor. Expressed more simply, it is the temperature to which any material must be heated before it will give off sufficient vapor to form an explosive mixture with air. Flash points given in most tables are determined by the closed cup method. Flash points determined in a closed cup are always lower than in an open cup.

Toxicity is measured by maximum allowable concentration (MAC) in parts per million (ppm) of solvent that can contaminate the air in a room for extended periods without endangering the occupants. Solvents with higher MAC have lower toxicity.

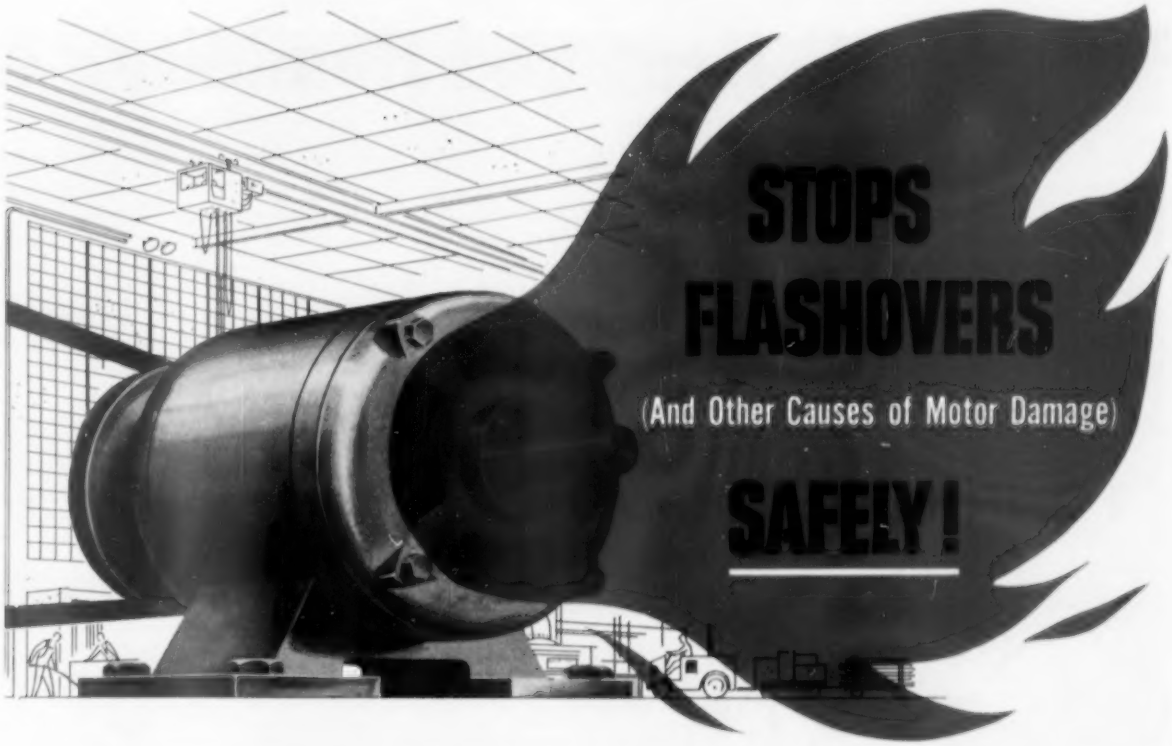
Speed of evaporation is also an important factor in toxicity. In addition to the rated MAC, the time it takes to reach that concentration must also be considered. A solvent of low volatility is generally less hazardous than one of high volatility with the same MAC.

Many excellent solvents are not safe for general use. Carbon tetrachloride, for example, is nonflammable but has won an evil reputation because of its poisonous fumes. Benzol is too toxic and too flammable for general use.

This discussion is concerned chiefly with those liquids which will dissolve grime and grease, rather than those used in complicated chemical processes. For cleaning, a wide range of petroleum hydrocarbons is available. Some are marketed under trade names or numbers. They are relatively nontoxic, with MAC around 500 and flashpoints up to 150 F. Best known of these are the Stoddard solvents with flashpoints of 100-120 F.

It should be assumed that all organic solvents are toxic. If used in any quantities, ventilation determined by an engineer must be provided. Most solvent vapors are heavier than air and must be exhausted at the floor level.

If solvents are flammable, keep fires and lights away and make



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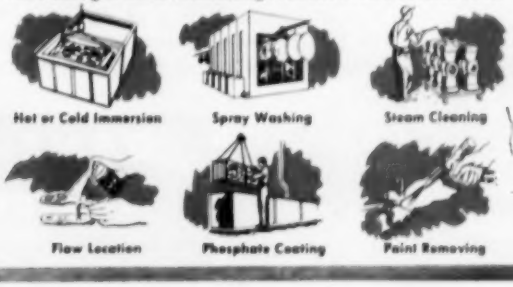

sure lighting fixtures, motors and switches are explosion-proof.

Since solvents dissolve fats and oils, they naturally dissolve the fats and oils of the skin. Workers in these processes should be provided with protective gloves or creams.

Manufacturers of solvents will be glad to give the flashpoints and MAC's of their products, also advice on the best solvent for the job and suggestions for safe use. * * *

Heat and Humidity

EXCESSIVE HEAT, due to climate and to manufacturing processes, provides some of industry's most complicated and expensive problems. Loss of productive efficiency at high temperatures is serious and human health and comfort are affected to a greater or lesser degree.

Accident rates are also influenced by lack of alertness caused by excessive heat and humidity.

Serious year 'round exposures include boiler and engine rooms, foundries, steel mills and glass plants. Seasonal heat hazards are found in construction work, public utility, highway and railroad maintenance, and farming.

When temperatures approach 90 degrees, especially with high humidity and lack of air movement, the human body rapidly loses its ability to compensate for atmospheric conditions.

Individuals vary considerably in susceptibility to heat but it is good economics and industrial relations to cool the working spaces as much as possible in summer and to protect workers exposed to heat-producing processes.

Avoiding the ill effects of heat and humidity requires close attention to working conditions by the employer, also observance of reasonable precautions by the worker. Even where air conditioning is not practicable much can be done to improve conditions.

Ventilation is most important. Keeping air in circulation by general mechanical ventilation is helpful, and spot cooling by fans often increases comfort. However, when the wet bulb temperature of the surrounding air is higher than that of the body, blowing air over the worker makes him feel even more uncomfortable.

In industries such as hot mines, glass plants, and steel mills where heat is excessive, it is frequently useless to blow air over workers unless it is cooled and dehumidified.

In some industries there are operations in which the atmosphere cannot be kept below maximum recommended temperatures. Radiation from hot objects presents difficulties in control. Radiated heat can be decreased by shields or insulation where fans would be ineffective.

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"You aren't. Almost everyone knows Chlorothene® is the safe, effective cold cleaning solvent. You can use it for spray, dip, wipe or bucket cleaning."

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"Can't. Unlike petroleum solvents, it has no flash or fire point."

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"It's a low toxicity solvent, too. Has an MAC rating of 500 ppm. In fact, our Safety Engineer recommended it."

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"Nope. Dow developed it."

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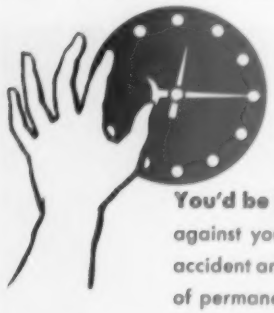

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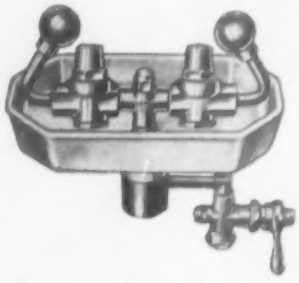

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water also offset the effects of hot surroundings.

Work clothing. For a hot, humid environment, clothing should be porous, light in weight and allow air to circulate around the body.

For exposure to local sources of intense heat and infrared and ultraviolet radiation, special protective garments are needed. Leather is widely used, and for more severe exposures, asbestos and wool are used.

Acute Ailments

Exposure to extreme heat, especially when accompanied by physical exertion, may result in heat cramps, heat exhaustion, or heat-stroke.

Knowledge of correct first-aid treatment for each type of ailment is important. All cases should receive prompt medical attention.

Heat cramps are due to excessive loss of salt and moisture from the body. They come suddenly and may involve skeletal or intestinal muscles. Even if lost body moisture is replaced by drinking plenty of water, loss of salt may cause heat cramps.

Heat cramps are relieved in a few hours by proper treatment but soreness may persist for several days.

Heat exhaustion is a shock-like state also resulting from loss of salt and moisture. Symptoms are pallor, relatively low temperature, weak pulse, a feeling of restlessness or anxiety, and sometimes unconsciousness. It is much more serious than heat cramps and is occasionally fatal.

A person with either heat cramps or heat exhaustion should be given salted water, if conscious, and put under medical care as quickly as possible.

Heatstroke (sunstroke) is caused by exposure to an environment in which the body is unable to cool itself sufficiently. It is not necessarily the result of exposure to the sun. Body temperature rises, and the heat-regulating mechanism breaks down.

Symptoms are severe headache, flushed face, high temperature,

Loren Farris
PERSONNEL DIRECTOR
Detroit Division
Chicago Rawhide Manufacturing Co.

"Look! It soaks up grease just like a sponge."

LAN-O-KLEEN removes 95% of all dirt and grime encountered in industry.
Easily — and safely!

LAN-O-KLEEN helps to protect the skin as it cleans. WEST — in pioneering the development of "double action" industrial cleaners — was the first to impregnate beneficial amounts of free lanolin into a corn meal type hand cleaner.

LAN-O-KLEEN is economical to use. It bulks greater than most other hand cleaners — therefore goes farther per pound. Too, the sturdy LAN-O-KLEEN dispenser rations just the right amount to do a quick, thorough cleansing job.

"We know of no safer hand cleaner than Lan-O-Kleen"

"We've always been interested in preventing dermatitis. This is why we've supplied our plant employees with Lan-O-Kleen for the past ten years. Its free lanolin and soft cleansing action help prevent skin irritations, yet quickly remove dirt, grease and grime," says LOREN FARRIS, Personnel Director, Detroit Division of Chicago Rawhide Manufacturing Company.

"Several of our departments have also used West Antiseptic Protective Hand Creams for a number of years. We know these aids to comfort and safety help keep our workers on the job at maximum efficiency."

Would similar results interest you? Send the coupon.

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visual disturbances and loss of consciousness. Death may occur within a few hours, but if timely treatment is available the patient has a good chance of recovery. One of the after-effects is inability to withstand heat.

In general, the same precautions will help to prevent or minimize all types of disability due to heat.

Sunburn can be painful and dangerous. In strong sunlight, the head should be covered and exposure of the skin kept at a minimum. Tan should be acquired gradually. Treatment is the same as for any other type of burn.

Use of Salt

Maintaining the salt in the body at an adequate level enables men to work at strenuous occupations where temperatures are unavoidably high.

For sedentary workers, normal use of salt with food may be sufficient. However, those whose jobs require greater physical exertion may not consume enough by this method.

Dispensing. The most convenient and popular method for providing salt is in tablet form. The 10-grain size is more frequently used. It may be obtained either as pure salt or with 30 per cent dextrose.

Tablets containing dextrose are more palatable and more easily assimilated by many persons.

Diabetics should be warned against tablets containing dextrose and plain tablets should be provided for them.

For those who find difficulty in taking salt, enteric-coated tablets are available. These pass through the stomach intact and dissolve in the intestines.

In most plants, a dispenser for salt tablets will be found beside the drinking fountain. Dispensers are made in several styles and sizes.

Water is as important as salt. A full glass of water (8 oz.) should be taken with each tablet.

Salt is sometimes added to the water where drinking water is not used in the industrial processes. Concentrations vary from .1 to .5 per cent, depending upon the temperatures and nature of the work.

Salted drinking water should be used only under medical supervision.

Caution. Persons with kidney or heart disease or high blood pressure should seek medical advice on the use of salt. Such men should not be placed on jobs where they would be exposed to high temperatures or heavy manual work. * * *

Drinking Water

WATER constitutes a large part of the human body and this water level is being depleted continuously through elimination, perspiration and breathing. It must be replenished frequently for comfort, health and efficiency.

Water must be cool and palatable and facilities located conveniently. Otherwise employees will not drink enough.

Clean, attractive fixtures are

IMPROVE EFFICIENCY **PROTECT** YOUR WORKERS

IMPROVE PRODUCTION: Stepan ph-6 is a specially formulated, sulfonated oil, bland skin cleanser . . . amazingly effective in removing oils, greases, and other industrial grime. Lotion-like effect actually protects the skin . . . leaving it clean, smooth, and supple. Stepan also offers a complete line of dispensing methods designed to meet every industrial requirement.

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Neutra-Foam

New mild synthetic skin detergent with excellent foaming properties. Leaves no disagreeable soapy odor on the skin.

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BRECK pH7 PROTECTIVE CREAM protects the hands against irritants such as lubricating oils, cutting compounds, tar, greases, rubber dust, aromatic and hydrocarbon solvents, fiberglass, paint and iron dust. It forms a non-sticky, invisible film over the skin. Breck pH7 Protective Cream is easily applied. It is easily removed with Breck Hand Cleaner or soap and water.

BRECK WATER RESISTANT CREAM protects the skin against the action of water and water solutions such as liquid coolants, emulsified cutting oils, mist and spray from alkali baths and plating solutions, cement and lime. It covers the skin with a light, protective film which is not slippery or sticky. Breck Water Resistant Cream has a pH value of 8.

BRECK HAND CLEANER helps eliminate the use of harsh, gritty, highly alkaline or defatting hand cleaners. It does a thorough cleansing job, yet is mild and non-irritating to the skin.

BRECK WORK CREAM is used after exposure to degreasing materials and at the end of a day's work. It substitutes fatty materials for the natural skin oils which have been removed. In this way Breck Work Cream helps keep the hands smooth, pliable and lubricated.

A Breck Industrial Preparations Booklet will be forwarded to you upon request.

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FINE ORGANICS SAFE-TEE® SOLVENTS CLEAN, DEGREASE . . . FASTER — SAFER — MORE ECONOMICALLY.

Now Fine Organics' improved SAFE-TEE Solvents bring you everything you could desire in an all-around cleaning and degreasing agent. Note these outstanding advantages.

- Low toxicity greatly reduces health hazards.
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- Harmless to all surfaces.
- Will not attack electrical insulations.

With Fine Organics' SAFE-TEE Solvents your cleaning and degreasing work is done faster, with fewer man hours, resulting in lower maintenance costs. Reduced equipment down-time substantially improves operating efficiency. SAFE-TEE Solvents are safe effective cleaners and degreasers for electric motors, power generators, condensers, starters, contact points, metal surfaces. No significant residues after drying. SAFE-TEE Solvents can be designed for your own specific requirements. Write today for "What do we mean by Safety Solvents" and complete technical characteristics of Standard SAFE-TEE Solvents. FINE ORGANICS, INC. 211 East 19th Street, New York 3, N. Y.

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211 East 19th Street, New York 3, N. Y.

also important, particularly for women employees and for customers.

These factors should be considered in planning facilities:

—Number of persons to be served
—Type of work—light or strenuous
—Temperature of workroom
—Purity of water
—Temperature of water
—Design of fixtures
—Location of outlets

One outlet for every 50 persons is a recommended minimum for industrial establishments. More will be needed where temperatures are high or work involves considerable exertion.

A person should not have to walk more than 50 ft. for a drink. If outlets are too far apart, employees will spend too much time from work or they will not drink enough water.

All rooms assigned for eating purposes should have a supply of drinking water. No drinking facilities should be installed in toilet rooms.

Water supply. Municipal health departments maintain a close watch over the water supply. But when the plant is located outside the city limits, and for temporary operations such as construction, public utility and oil-field work, the employer must supervise the water supply. It should be analyzed regularly.

If unapproved or "service" water is used for industrial processes or for fire protection, signs should be posted warning against its use for drinking. Care must be taken to avoid possibility of cross connections between the two systems.

Sterilization. Water of questionable purity can be made safe for drinking by chlorination or boiling. Compounds for sterilizing water, some in convenient tablet form, are available.

Filtration is desirable for removal of sediment but it will not destroy harmful bacteria.

Temperature of water. For workers who perform heavy manual labor, from 50 to 55 F. is recommended. For office workers, restaurant patrons and others

who are less active, the temperature may be as low as 45 degrees.

Dispensing

Approved methods of dispensing drinking water are:

—Fountains of approved design.

—Paper cups provided at outlet.

Drinking fountains with individual cooling units are more suitable for many types of industry than a central cooling system. Fountains should conform to specifications of the ASA Code Z 4.2. Important features are:

—An angle jet, which prevents the water falling back on the nozzle.

—A guard to keep the user's lips away from it.

Older installations in factories, offices, stores and public buildings which do not conform to hygienic standards can often be modernized at reasonable cost.

Desirable accessories in drinking fountains are line strainers and pressure regulators. An outlet for filling glasses is also useful, particularly for office use.

Hazardous locations. For use where flammable gases, vapors and dusts may be found, explosion-proof fountains are available.

Paper cups should be kept in dust-proof containers and receptacles provided for used cups. The container must be kept filled or workers will salvage old cups.

Maintenance. Regular cleaning of porcelain and metal keeps fixtures attractive and sanitary.

A cuspidor or sand urn should be provided at each fountain to receive discarded chewing gum, tobacco, etc.

Salt tablets. A dispenser should be located near the drinking fountain.

Isolated Jobs

Portable containers. For jobs remote from city water mains, such as construction work, public utilities and railroad maintenance, mining, and other isolated working places, there are safe and convenient methods of providing drinking water. It is not necessary to depend on an open bucket with one cup or dipper for the whole crew.

Insulated coolers, with dispensers for paper cups are fre-

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Pax-Lano-Sav Heavy Duty skin cleanser cleans dirty hands really fast. It's safe, sure and gentle because of the exclusive Pax-Lano-Sav emollient combined with years of know-how and skillful formulation. Pax-Lano-Sav Heavy Duty is your best bet for sure protection against industrial skin trouble.

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Ask your Pax representative to show you how he can reduce *your plant's* skin care costs. Write or call for special in-plant service survey today!

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Write to solve your Skin Care Problems

☐ Please have your representative call to provide "in-plant" skin care survey.

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4-44 Radial Full-Flow Muffling Action!

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- **FULL-FLOW ATTENUATION**
  With Radial Full-Flow muffling, exhaust air is not restricted. Performs at top efficiency regardless of air volume or pressure. Sturdier construction and improved wear quality designed to give better service, efficient and longer trouble-free performance.
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  Atomuffler stops 99.9% of objectionable noises of air-operated equipment. Completely eliminates injurious noise hazard. Easily installed, made in eight standard pipe sizes, economically priced.
- **IMPROVES WORKING COMFORT**
  Protection from annoying exhaust noise and improved operating comfort are important user benefits. Prevents fatigue slow-down and frayed-jumpy nerves. Send for descriptive literature and name of local distributor.

Recommended by Liability Insurance Companies

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Representatives in Principal Cities

quently used. The container should have a tight-fitting cover.

Portable drinking fountains provide another method. Pressure is maintained with a hand pump and slight pressure on a valve releases a jet of warm water at an angle, as in approved permanent installations and a guard keeps the lips away from the nozzle. Insulation keeps the water cool for several hours.

Vacuum bottles for individual use may be provided for remote or hard-to-reach places, such as crane cabs.

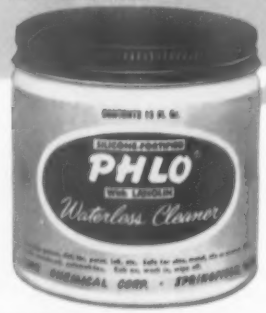
Purification. If it is necessary to depend on a local water supply of uncertain purity, the water may be made drinkable by tablets available for this purpose.

Salt tablets. In many isolated jobs men perform strenuous work under the hot sun and perspire freely. Salt tablets may be issued in individual packages. * * *

INDUSTRY'S CHOICE — Coast to Coast

PRACTI-KREME

. . . This combination skin protector *and* cleaner has been used and proved to check dermatitis *before* it starts — for over 15 years. Applied before work, it provides a flexible, fat-based coating over the skin. When moistened after work, Practi-Kreme cleans completely and quickly.



NEW PHLO WATERLESS CLEANER

. . . Safe, quick and easy to use, Waterless Phlo removes all industrial soils. Containing *both* silicone and lanolin for double protection, it is milky white, smooth in consistency. New handy dispenser makes using and refilling a simple matter. Management and workers agree — coast to coast — there's no better cleaner than Phlo Waterless.

PHLO

. . . is a neutral skin protector rich in lanolin and *now* fortified with silicones. Magic silicones make Phlo water-repellent, adhesive, non-toxic. Phlo is a most effective barrier against bacteria, irritants and soil. Try it . . . then you'll *know* Phlo should be in your plant *now*.

Distributorships available in some areas.

Write for free test samples today.

THE CHEMICAL CORPORATION 54 Waltham Avenue, Springfield 9, Massachusetts

Food Service

IN-PLANT FEEDING is no longer an experiment in industrial relations. It is firmly established in industry. More than half of the manufacturing plants in the U. S. A. now serve food and that includes practically all of the large and medium-sized establishments.

Service ranges from vending machines dispensing hot coffee to cafeterias serving complete meals. Table service has become rare in industrial restaurants.

Plants with fewer than 250 employees represent nearly 96 per cent of the country's manufacturing establishments. Vending machines and disposable paper utensils have made it possible for many of the small concerns to provide some type of food service.

Types of Service

There are five main types of food services for industry:

1. Cafeterias preparing and serving hot meals.
2. Canteens or lunchrooms dispensing sandwiches and other packaged foods and hot and cold beverages. A few hot foods may be served.
3. Mobile canteens which circulate through the plant. The trend may be away from this type which, it is claimed, wastes time and disrupts production.
4. Box lunch service.
5. Vending machines.

Vending machines now dispense anything that can be packaged — soup, stew, chili, french fried potatoes, sandwiches, pastry, fresh fruit and hot and cold beverages.

The increasing popularity of vending machines is due largely to improved design. Modern machines are more efficient in keeping foods hot and compact refrigeration units have been developed to chill foods. Disposable containers and the application of radar for cooking on the spot have also expanded automatic service.

The trend is definitely to machine service. The plant lunchroom of the future may rival New York's famous Automat restaurants.

Vending machines are serviced by the companies installing them, relieving the employer of the responsibility of operation.

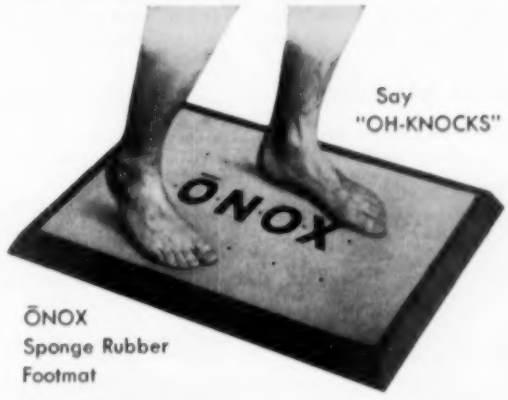
Few companies expect to make a profit from the service. The usual arrangement is to receive a percentage of the gross receipts which is turned over to employee recreation and benefit funds.

Vending machines, while growing in popularity, are still a supplementary service in most plants. Most of the companies using them also have canteens or cafeterias.

Paper utensils eliminate dishwashing and breakage, and make it possible to operate with a smaller staff. Paper utensils for frozen or for hot foods have simplified food service.

Management. Many companies have turned cafeteria and canteen operation over to caterers. Others, however, do not like the idea of assigning management of the

74% USE ŌNOX®
TO STOP ATHLETE'S FOOT



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ŌNOX Sponge Rubber Footmat

74 of the 100 Largest Manufacturers use ŌNOX SKIN-TOUGHENER

Modern research has upset old theories about Athlete's Foot control. Skin specialists have proved that the best way to prevent Athlete's Foot is to improve the condition of the skin. *That's what ŌNOX does.* ŌNOX mineral salts toughen the skin and make it resistant to fungus growth.

No splash • No mess • No waste • Odorless
Easy to maintain • Nothing to get out of order
Men like ŌNOX • Relieves tired, aching feet

60 DAY TRIAL OFFER
We will ship your trial order for any amount of ŌNOX and footmats. *You pay nothing* unless fully satisfied after 60 days' use.

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Powdered Soap
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EVERY TYPE OF SKIN CLEANSER
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manufactures all three from raw material to finished product!

A Specialized Soap for Every Type of Plant Requirement!

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To meet every conceivable industrial need . . . for light, heavy or extra heavy duty, for general plant or office use, or to solve specific cleansing problems.

CHOICE OF BAR SOAPS

- A hard milled soap, extremely economical, especially designed for industrial use.
- An extra mild soap for dry or sensitive skins.
- A hexachlorophene product for those departments requiring this type of soap.

LIQUID SOAP

Furnishes profuse lather; will not irritate or dry the skin. Shipped in non-returnable containers.

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Because Lightfoot manufactures its basic soap from raw material to finished product, you have the assurance of constant, uninterrupted supply of uniform quality, plus a "price right" sales policy.

PROMPT DELIVERIES

Stock warehouses in key cities fill orders immediately upon receipt.

DEPENDABILITY

For more than 40 years, America's leading plants have accepted the name "Lightfoot" on a cleansing product as a symbol of efficiency and dependability.

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Lightfoot Advisory Service aids on cleansing problems of all kinds, and has saved substantial sums for many customers.

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KIP ANTISEPTIC OINTMENT
In easy-spread tubes. Choice of sizes. Quick pain relief, combats infection.

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Soothing antiseptic oil in handy bottle form. With benzocaine 2%.

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In various size tubes. Contains 5% tannic acid in water soluble jelly.

PAIN RELIEF FOR BURNS CUTS, SCRAPES

Through Safety Appliance Jobbers

KIP, INC. LOS ANGELES 21

service to outsiders. If employees do not like the food or the prices, the company, not the caterer, gets the blame. So they provide professionally managed plant cafeterias supervised by the personnel manager.

The contractor gets a guaranteed minimum based on a stipulated per-employee cost of operation. Any operating loss is assumed by the management. The company can decide whether the contractor can make the service self-supporting by serving beans or hash on the plate lunch or giving them roast beef with the employer making up the deficit. Many larger plants follow the latter policy, regarding the deficit as an investment in employee good will.

Smaller companies more often hire an industrial caterer. Foods are prepared in a central kitchen and transported to the plant. This avoids investment in kitchen space and equipment and maintaining the necessary staff. The employer provides the eating space and dishwashing facilities. Dishwashing is kept at a minimum by disposable facilities.

Vacuum insulated containers make it possible to carry hot foods prepared in the central kitchen to lunchrooms some distance away. This equipment is used by some large plants with scattered lunchrooms as well as by caterers.

Sanitation. Wherever food is prepared or eaten, constant vigilance is necessary to maintain clean, sanitary conditions.

Dishes, if possible, should be washed by machines which can use stronger detergents and hotter water than hands can stand.

Facilities for the disposal of garbage, waste paper, bottles, etc., should be provided.

Workers who bring lunches from home and those who patronize box lunch services may eat in locker rooms, if clean and well ventilated, or in work areas where processes would not make it undesirable or dangerous.

Rest periods. The coffee break has become an established institution. Passes of 10 to 15 minutes in the morning and afternoon for coffee, milk or a soft drink help to avoid fatigue. * * *

Radioactive Materials

STANDARDS for the protection of atomic energy workers and the public against radiation hazards arising from activities licensed by the United States Atomic Energy Commission have been issued by the Commission.

Limits are prescribed governing exposure of workers to external radiation, concentrations of radioactive material which may be discharged into air and water, and disposal of radioactive wastes.

The standards established by this regulation (10 CFR, Part 20, "Standards for Protection Against Radiation") became effective February 28, 1957. Since the regulation was first published in July 1955 many government and scientific organizations have worked with the commission in the revision of these standards.

The standards agree substantially with those published by the National Committee on Radiation Protection in NBS Handbook 52, *Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water*, and NBS Handbook 59, *Permissible Dose from External Sources of Ionizing Radiation.*

The Radiation Symbol. With the introduction and increasing use of radioactive materials, a distinctive warning symbol was devised by the AEC. It consists of a 3-bladed design in purple or magenta against a yellow background. Accompanying words describe the nature and seriousness of the exposure.

Protective Measures. Methods of keeping external radiation down to a reasonable value are:

1. Keeping personnel a sufficient distance from the source.
2. Shielding the source.
3. Reducing time of exposure.

The standard shielding material against x-rays and gamma rays is lead. However, it is often more convenient to use other building materials as shields, particularly with x-rays from sources of relatively low intensity, and cheaper to use other materials for shielding sources of very high intensity.

Personnel monitoring. Employees working around sources of radiation should carry personal radiation monitoring devices. Types of devices include film badges, pocket chambers, pocket dosimeters, film rings, etc.

Monitoring devices are available from a number of commercial organizations which take full responsibility for reading them and providing a permanent record of the exposure received by each individual.

Laboratory monitoring. Areas and equipment are checked with an ionization type of survey meter for contamination with alpha and beta emitters and with a Geiger counter for gamma radiation. Al-

SEECLOTH

CLEANS AND MISTPROOFS

WHAT SEECLOTH IS:

SEECLOTH is a chemically treated fabric which when rubbed on glass both cleans and prevents fogging or misting. It has found use in industry as a convenient method for cleaning and preventing the fogging of goggles of workers who must protect their eyes in various industrial operations.

ECONOMICAL:

It is the most convenient and economical method known for this purpose. One piece (8" x 9") will last for a number of months when used on goggles or glasses.

INCREASES WORKER SAFETY:

The fact that the worker has the means for preventing misting of his goggles right on the job increases the safety of the operation since it reduces the temptation to continue to work with misted glasses. He can fogproof them without leaving his work.

HOW TO USE SEECLOTH:

All that is necessary is to wipe the very slightly moistened glasses with the dry SEECLOTH and thus mist-proof the glasses for a considerable period.

OTHER USES:

SEECLOTH has also found use in preventing misting of the inside of windshields in foggy or damp weather. Here also all that is necessary is to rub the very slightly moistened glass surface with the dry SEECLOTH. Mist will then not form on the area that is rubbed. Other applications include its use on spectacles, mirrors, windows, etc.

HOW SEECLOTH IS PACKAGED:

3" x 8" pieces (not individually packaged). Suitable for eyeglasses and may be kept in the case with the glasses. 8" x 9" pieces (individually packaged in polyethylene envelopes). Suitable for goggles and masks and fits easily in the pocket of coveralls. 12" x 18" and 16" x 18" pieces (individually packaged in polyethylene envelopes). Suitable for automobile windshields, household use, etc., and fits comfortably in the glove compartment of a car or in the drawer of a kitchen cabinet.

In addition to the standard sizes listed above, SEECLOTH will be cut to special sizes on order and is also available by the yard —36" wide.

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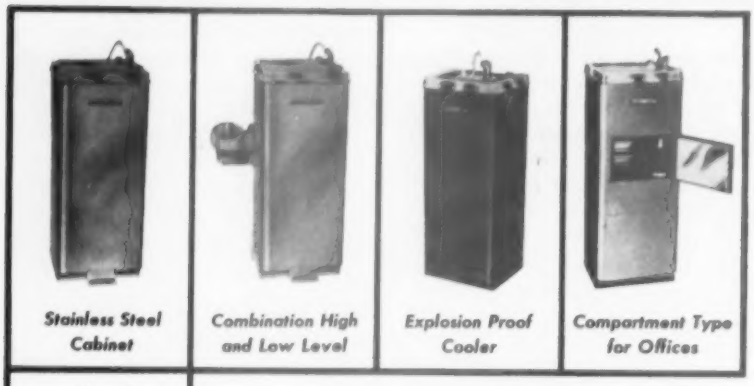
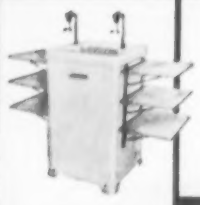
Samples on request. Write Dept. NS 57-3.

WHICH *Cooler* IS BEST FOR YOU?



Stainless Steel Cabinet | *Combination High and Low Level* | *Explosion Proof Cooler* | *Compartment Type for Offices*



Cafeteria Cooler for Restaurants

Here are just some of the many types of coolers you'll find in the new Halsey Taylor line. For office or plant use, for hazardous locations, for factory cafeterias and dining rooms, for any of today's vital needs, Halsey Taylor makes the right cooler for the purpose. Each has the extra advantages of up-to-the-minute engineering, built-in dependability, freedom from maintenance. Get our latest catalog or see Sweet's.

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COOLERS

The Halsey W. Taylor Co., Warren, Ohio

ENGINEERED THE BEST TO MEET EVERY SERVICE TEST

F-71

You'll find Ruemelin Fume Collectors ideal for stopping noxious welding fumes *at their source*. Counter-balanced inlet hood stays in working area, automatically. Improves working conditions . . . lessens fatigue . . . paves the way for increased plant production. Thousands in everyday service. Write for Fume Collector Bulletin No. 37E.

•

(Left) "Illustrating the 15 ft. reach collector. Handles large or small work. Units available with 9 ft., 15 ft., 17 ft. and 20 ft. reach."

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pha and beta emitters are especially dangerous as sources of internal radiation.

Coats, trousers and shoes and operators' hands are monitored daily. When garments show activity beyond a specified level they must not be sent to a commercial laundry.

With these devices and procedures it is possible to determine the radiation dose to any person. Conditions can then be adjusted to keep the dosage within conservative tolerance levels. * * *

Air Conditioning Makes Climate to Order

AIR CONDITIONING, as defined by the American Society of Heating and Air Conditioning Engineers, is "the process of treating air so as to control its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space."

Control of temperature and humidity, as well as air motion, and removal of contaminants are necessary for a comfortable environment. This means cooling and dehumidifying workroom air in summer and heating and humidifying it in winter.

Summer air conditioning now is almost universal in theaters and even the less pretentious restaurants. Each year, more stores and offices are air conditioned; sales of room air conditioners are increasing.

In industrial plants, temperature and humidity usually are influenced by the product's requirements, which may not coincide with the most comfortable conditions for persons. However, more attention is being given to summer comfort and the possibility of raising human efficiency, which slumps seriously as temperature and humidity rise.

The workroom temperature shouldn't be too much lower than that outdoors. Not much more than 10 degrees difference should exist between interiors of buildings of public occupancy and the outside.

Air conditioning and modern lighting make today's plant practically independent of the climate outdoors. A self-sufficient build-

ing may be windowless or, for psychological reasons, have fixed sash to give occupants a glimpse of the outdoors.

Hot Jobs Can Be Made Comfortable

Operators of overhead traveling cranes often are subjected to extreme heat and humidity, as well as to gases, vapors and dusts from operations below.

Cab coolers designed to improve conditions on such jobs are self-contained units that need only an electrical connection. They supply clean air, cooled and dehumidified, to the cab.

Locomotive cranes, which often operate in hot locations, can be provided with similar equipment. They can be used, too, to heat the cab in cold weather.

For pulpits and other control locations in steel mills where heat, dirt or fumes create uncomfortable and hazardous conditions, similar equipment has been designed.

Ventilation

—*From page 56*

and airplane wing compartments and fuselages.

Where objectionable fumes are produced, as in welding under some conditions, ventilators operating on the exhaust principle are more effective.

Disposal of Contaminants

Equally as important as collecting the air contaminants is its disposal. Gases, vapors and mists may often be discharged to the outside atmosphere at a point where they will not recirculate around the premises in harmful concentrations.

Dusts, both harmful and nuisance, require the use of dust collectors in the system.

Recirculation of air from exhaust systems is generally undesirable, particularly when the air has contained gas or fumes. Where only nuisance dusts are involved, recirculation after cleaning is often permissible.

Recirculation is not desirable when handling dusts containing such substances as lead, silica and asbestos.

Air coming from the cleaning device must fall within the permissible range for toxic or flammable dusts.

Dust Collectors

Methods of removing dust from the air exhausted by the system include:

1. Filtration.
2. Electrical precipitation.
3. Wet collectors.
4. Dynamic precipitation.
5. Supersonic flocculation.

Filters are porous mediums through which dust-laden air is drawn. Some are designed to collect dust in the form of a layer on the upstream surface. This is characteristic of cloth and paper filters. Thicker types, such as those of metal mesh or fiber glass treated with oil, have greater dust-

THE SOLUTION TO AN OLD INDUSTRIAL PROBLEM

Contact Dermatitis

SILCONEX (77% silicone) is the most universal skin ointment now available. It protects not only against water dissolved materials but also against solvents and oil-solvent—water—chemical mixtures. It resists exposure to strong acids and alkalis, oxidizing agents, salts and other chemicals whether in water or organic solution. It prevents initial sensitization by allergens. It is non-conducting and therefore useful in electronic operations. Simple to apply, one or two applications a day provide ample protection. It has an important place as the most universal weapon against contact dermatitis.

CLEREX & H-R CREAM SOLVENT PROTECTION protect the skin against organic solvents. They wash off with soap and water. CLEREX is a gel which forms a continuous, strong, elastic skin-adherent film which does not interfere with tactile sensation. The film is insoluble in all anhydrous organic solvents, oils and greases. It protects against the hydrocarbons (benzene, benzol, toluene, gasoline, varsol, turpentine, kerosene, solvent naphtha), the chlorinated hydrocarbons, nitriles and the polymerizable monomers (styrene, acrylonitrile, and unsaturated esters for producing polyester resins). Used in making and using paints, varnishes, plastics, polyester resin—fiberglass compositions, lacquers, inks, and in metal degreasing using trichlorethylene. H-R CREAM is a modification of CLEREX with a vanishing cream base. It is highly resistant to all the materials listed under CLEREX. It is useful where protection must be applied to the face and arms as well as the hands. It has proven highly effective against phenolic vapors, creosote, extreme exposure to coolants, tars, rubber-asphalt and rubber-tar mixtures, petroleum oils, plastic and adhesive compositions.

HYDREPEL-S is a protective cream which forms a film on the skin protecting it against water solutions. Here a plasticized ethyl cellulose-castor oil composition in a vanishing cream base is combined with a suitable silicone oil to reinforce its resistance to water-borne irritants, detergents, salt solutions, weak acids and alkalis. Instantly removable with HYDREPEL REMOVER.

VEREX—a general purpose barrier cream widely used in both the office and the plant, in the mechanical, textile, chemical, rubber and process industries—protecting the skin against ordinary exposure to coolants, dirt, grease, inks, cement, sulphur, rust, carbon black, etc. Protects against contact with poison ivy. Soothing to the skin. Washes off with soap and water.

HYGIENE RESEARCH INC.

684 Broadway, New York 12, N. Y.

Literature and samples on request. Write Dept. NS7-3

holding capacity but do not collect the finer particles.

A filter should have:

—Low initial resistance to air flow.
—Reasonable length of service.
—Efficiency under changes of temperature and humidity.
—Low flammability.
—Reasonable replacement cost or ease of cleaning.
—Low maintenance cost.
—Freedom from odors.

Electrostatic precipitation is highly efficient, particularly for fine dusts which are difficult to remove by other methods. It offers low resistance to air flow. First cost and maintenance cost are relatively high.

Portable units, recently introduced, are helpful in removing dust and smoke from small rooms.

Precipitators are less effective in collecting large particles moving with considerable force. For high concentrations of dust they generally require pre-cleaners. They are valuable when the proc-

—*To page 118*

EYE WASHING FOUNTAIN

SAVE EYES!

Leading industrial doctors advise immediate washing with plenty of running water as the best first aid treatment for any chemical in the eyes. Records prove that washing with water for ten minutes or more, close to the accident, is necessary to reduce or eliminate eye damage.

Forehead operation leaves hands free to open eyelids so water can be directed wherever chemicals might be lodged. Sanitary white baked enamel bowl is resistant to most fumes.

Over 500 industrial plant installations have been made to date.

Write For Details.

VALVE Chain Operated Quick Action Self-Closing

NEW EMERGENCY SHOWER

The B & A Shower is the quickest and most satisfactory way to saturate a worker with gallons of water the instant an accident occurs, to prevent a disfiguring burn—even a fatality.

Special shower head, no holes to clog—can be used where unfiltered water prevails.

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DISFIGURING FACIAL CUTS AND BURNS!
CUTS AND CHEMICAL BURNS ON ARMS AND BODY!
THIS HAPPENS WHEN UNPROTECTED GLASS BOTTLES ARE BUMPED

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are widely used for the safe handling of glass bottles containing harmful chemicals; also the storage and recovery of expensive serums, biologicals, and other costly products.

Painful cuts, disfiguring burns, loss of eyesight, or even a fatality, do result from corrosive liquid splash and flying glass when unprotected bottles shatter.

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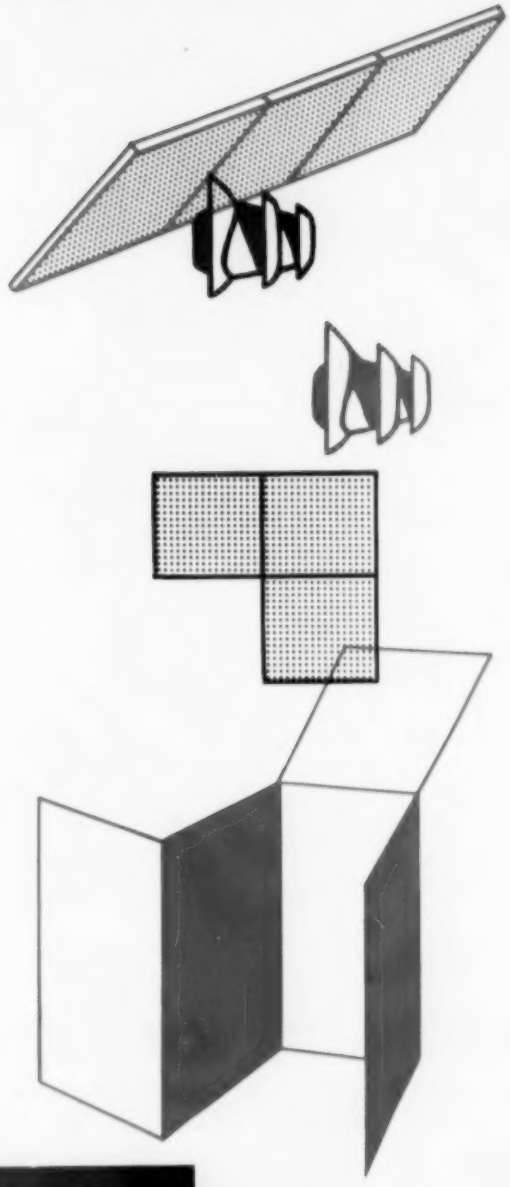
• • •

NOISE is one of the undesirable by-products of civilization. On and off the job, millions of persons are exposed to sound levels much higher than those of 50 years ago.

Compensation for loss of hearing due to occupational causes is increasing, but that is only part of the cost of noise. Fatigue, with resulting inefficiency and increased susceptibility to accidents are inconspicuous but heavy items in the annual noise bill. Depreciation of property values must also be included.

Noise control has become an important branch of industrial health engineering. The problem is complex and solutions are often difficult and expensive.

There are two methods of control. One deals with eliminating or muffling noise at its source; the other concerns protection for the individual who must work in noisy surroundings. Both may be needed in many situations.



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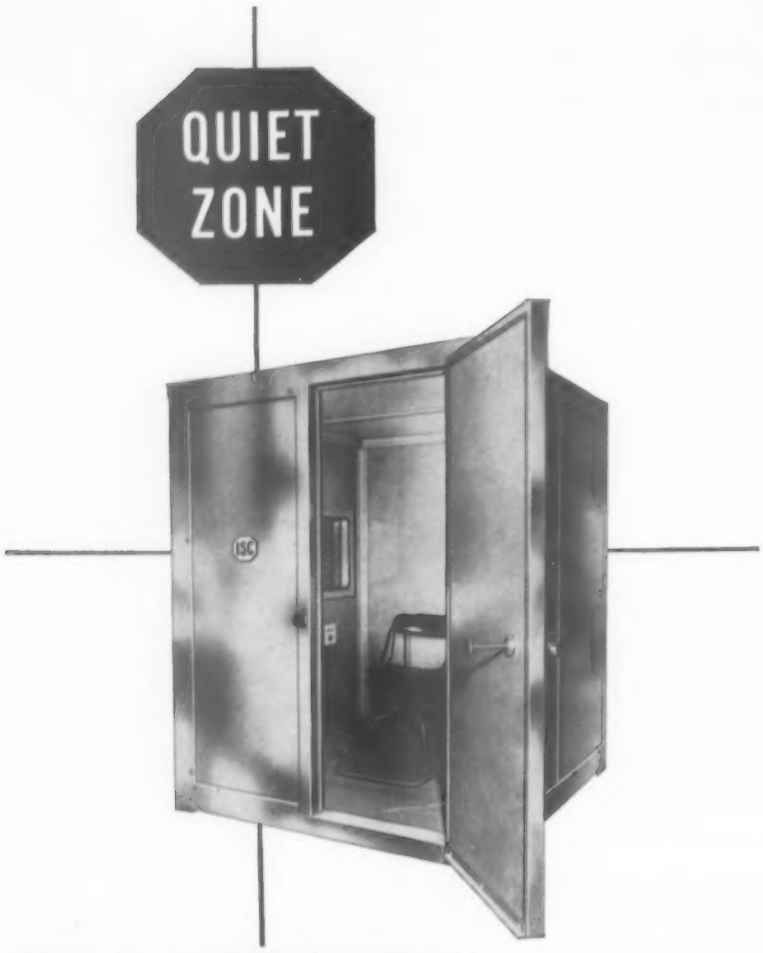
NOISE CONTROL



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Ample Testing Facilities. Koppers Audiometric Testing Room has 4 input jacks for instruments plus an external instrument shelf.

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Engineered Products Sold With *Service*

Noise Control

Hearing protection in the jet age

NOISE is one of the by-products of civilization—and one of its more serious problems. People do learn to live and work with higher levels of noise but at a high cost in fatigue and nervous strain.

Industry has become conscious of the cost of noise through many claims for impairment of hearing incurred on the job.

Settlement of these claims, however, does not cover the total cost of noise. Fatigue, reduced efficiency and labor turnover are among the less obvious costs.

Noise, as defined by the engineer and the hygienist, means excessive and unwanted sound. Components of noise are:

—Intensity or loudness
—Frequency or pitch
—Quality or timbre

Measurement of Noise

1. Intensity or loudness. Intensity or loudness of noise is measured by a sound level meter, commonly called a noise meter. It consists of a microphone, an amplifier, a calibrated attenuator, three frequency response characteristics controlled by three taps and an indicating meter.

The unit of sound measurement is the "bel," or more conveniently the "decibel" (db.) which is one-tenth of a bel, named in honor of Alexander Graham Bell. A level of zero decibels represents roughly the weakest sound which can be heard by a person with very good hearing.

Noise levels produced by familiar sources of sound are shown in Table I.

2. Frequency and quality. The sound level meter measures only weighted or unweighted sound pressure. For a more complete description of sound, measurements must involve frequency and quality or timbre.

Different types of noise have different effects on the hearing mechanism. Noise of high intensity is believed to be more injurious to the hearing when it is of high frequency than when the frequency is lower. A locomotive whistle, for example, produces a sound of low frequency, while an air hose produces a sound of high frequency.

TABLE I
Scale of Representative Sounds (Decibels)

Zero Reference	0
Whisper	20
Low Street Noise	40
Conversation	60
Heavy Traffic	80
Critical Level	90
Subway	100
Airplane	120
Jet Engine	140

Two sounds of identical intensity and pitch may vary appreciably in the annoyance they cause due to differing harmonic make-up or quality.

Information on the distribution of sound pressure as a function of frequency may be obtained through measurements made with a sound level analyzer. Several types of analyzers are available and the choice will depend on the use to which data will be put.

Injurious Levels

Limits for injurious noise are still vague and uncertain. The whole noise problem requires much more research and evaluation.

The level at which noise becomes definitely injurious is generally placed at 90 db.

In addition to actual intensity of sound, these factors must be considered:

—Total length of exposure
—Length of exposure period
—Whether sound stimuli are continuous or interrupted
—Length of interruptions
—Type and space of environment, with reference to reverberation
—Age of employee
—Record of previous trouble

Various plant operations should be tested with an approved sound meter and a record of noise levels compiled by departments. This refers to levels more or less continuously present, not occasional high intensity noise.

In the absence of a sound level meter, an approximate idea of the noise intensity may be obtained as follows: Walk through the plant

TYPES OF ear protectors used at Lockheed Aircraft Corp. These include muffs, stopples, and balls of wax and cotton to be molded by the user.

with another person having normal hearing and try to carry on a conversation. If shouting is necessary, the sound level is usually higher than 90 db.

Methods of Control

Methods of noise reduction fall into two classes: (1) Engineering; (2) Medical.

I. Engineering Control

Methods for reducing the noise level may be classified as follows:

1. Control at source. The most fundamental attack on noise hazards is removal at the source. With good engineering design much noise can be eliminated, as is evidenced by comparison for noise of a new streetcar or subway with the older ones. Also, most home appliances have been greatly quieted in recent years by improved design.

Much unnecessary noise results from worn and improperly maintained machines. It is important, therefore, that machines be kept in good operating condition.

2. Substitution. Another method of noise control is to substitute a less noisy operation, if possible.

SOUND LEVEL surveys of various operations determine need for ear protection. Several types of instruments are available for these tests. (Allis-Chalmers Manufacturing Co.)

Spot, arc or flame welding may be substituted for riveting in some operations. While application of this method may be limited, nevertheless it should be considered.

3. Isolation. Frequently noise can be isolated so that its disturbing effect will be encountered by fewer people. A noisy machine may be removed from a room containing many people and placed elsewhere so as to expose only the employees necessary for the job. These should be provided with ear protectors.

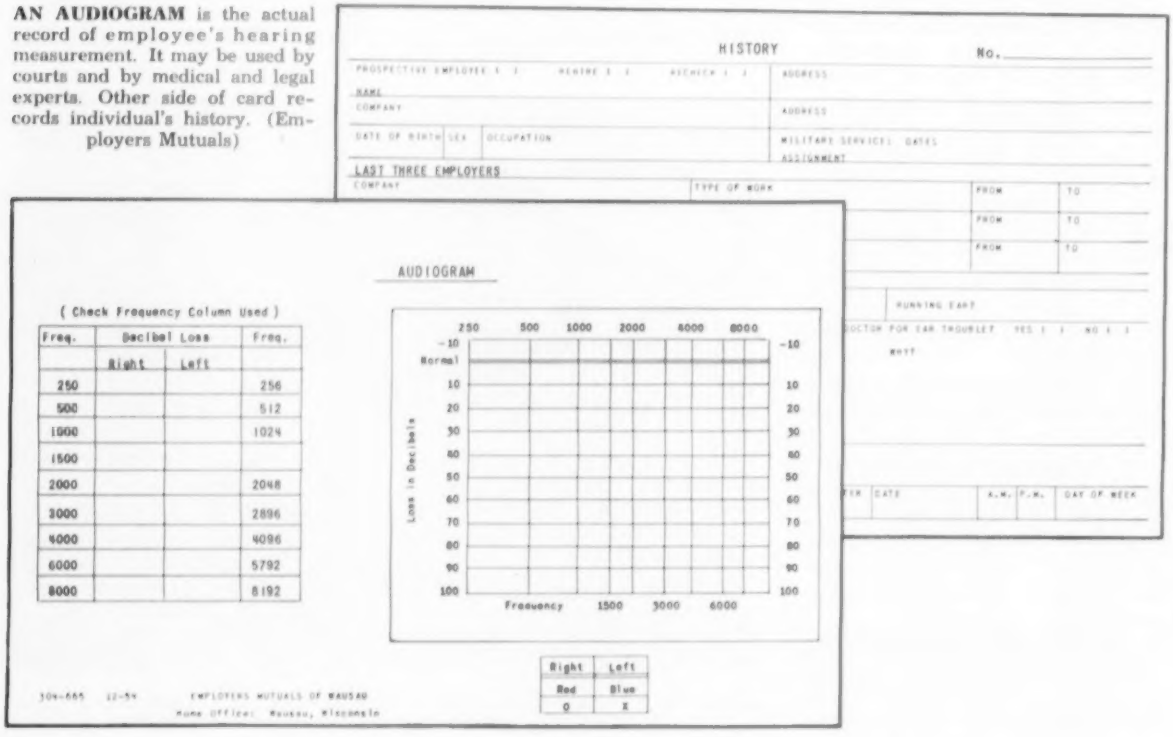
Well-insulated partitions and tightly-closed doors, preferably of the refrigerator type, should always be provided between a noisy room and adjoining areas.

Another aspect of segregation from noise is reducing time of exposure. Noisy processes should be made as automatic as possible, so that workers can retire to a quieter area at frequent intervals. Quiet surroundings should be provided for lunch and rest periods.

4. Resilient mountings. If heavy machines are firmly bolted to concrete or wood floors, the floor often becomes a huge sounding board. This not only amplifies the original noise volume but helps spread the noise throughout the entire building.

Rubber or other resilient mountings will usually reduce both the vibration and noise. Resilient floor coverings further reduce the noise level.

Many types of vibration insulators are available commercially.



HISTORY

No.

PROSPECTIVE EMPLOYEE [ ] REHIRE [ ] RECHECK [ ]

NAME

COMPANY

ADDRESS

ADDRESS

DATE OF BIRTH | SEX | OCCUPATION

MILITARY SERVICE: DATES

ASSIGNMENT

LAST THREE EMPLOYERS

COMPANY | TYPE OF WORK | FROM | TO

FROM | TO

FROM | TO

RUNNING EAR

DOCTOR FOR EAR TROUBLE YES [ ] NO [ ]

WHY?

DATE | A.M. | P.M. | DAY OF WEEK

AUDIOGRAM

(Check Frequency Column Used)

Freq.	Decibel Loss		Freq.
	Right	Left	
250			256
500			512
1000			1024
1500			
2000			2048
3000			2896
4000			4096
6000			5792
8000			8192

Right	Left
Red	Blue
O	X

304-665 12-56 EMPLOYERS MUTUALS OF WAUSAU

Home Office: Wausau, Wisconsin

AN AUDIOGRAM is the actual record of employee's hearing measurement. It may be used by courts and by medical and legal experts. Other side of card records individual's history. (Employers Mutuals)

Because each machine is a problem in itself, engineering advice should be obtained.

5. Sound-absorptive materials. These are extremely useful for controlling noise in buildings. Hard surfaces, such as plaster and brick walls, reflect sound and cause reverberation. Sounds coming from all directions, as well as those coming from long distances, apparently undiminished, are very annoying.

A remedy is the absorption of high frequency sounds by the application of acoustical materials. This consists of applying sound absorbents to ceilings and walls in the form of acoustical tiles, plasters, sprayed-on compositions, and blankets which have been prefabricated from porous material, such as glass wool.

Where structural treatment is not practicable, acoustical baffles suspended from the ceiling bring a substantial reduction in noise levels.

Acoustical treatment cannot lessen the direct noise of machines but is highly effective in decreasing indirect or reflected noise.

The problem of sound control by acoustical treatment is far from simple. To get results from the investment the installation should be planned by experts in the field.

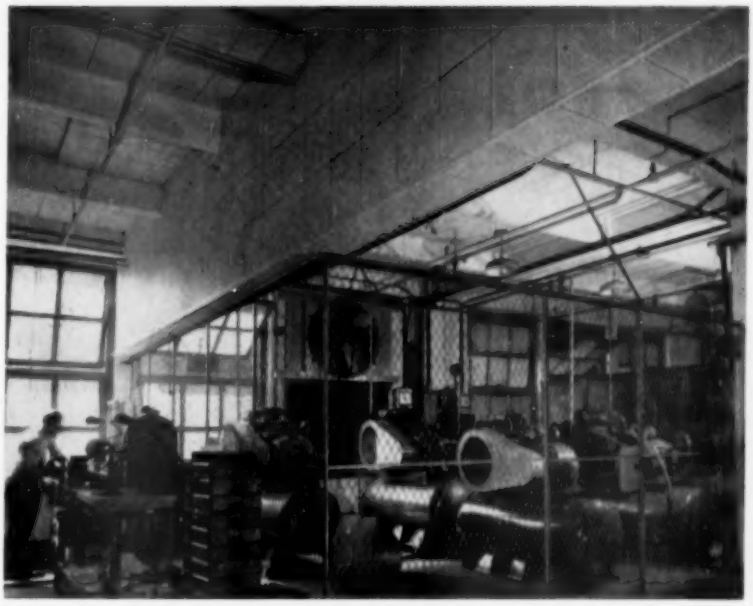
6. Protective devices. There are some industrial operations where the best sound control measures now available still leave the noise level too high for safety. The outstanding example of this situation is in the testing of jet engines.

In such cases operators should be protected with properly designed and fitted ear protectors which will reduce the intensity of the sound reaching the hearing mechanism. The protection which these devices offer for the ears is as necessary as safety goggles for the eyes.

Personal Protection

Four types of devices for ear protection are available commercially:

1. Substance molded by the user. Pliable balls of wax and cotton are molded by the user to fit his ears. This is an inexpensive and effective type of protection, satisfactory for most operations. These plugs should not be confused with wads of untreated cotton stuffed in the ears.



ACOUSTICAL walls and ceilings lower sound levels by cutting down amount of reflected sound. For extreme conditions, expert engineering is needed.

2. Molded plugs (stopples). This type of protection consists of molded plugs of neoprene, vinyl plastic or rubber which are inserted in the ear canal. These are easily cleanable and the first two types are resistant to ear wax.

DOUBLE PROTECTION. Both ear muffs and stopples are worn by employees inspecting jet engines in operation. (Chance Vought Aircraft)

3. Muff types. There are two designs of the muff-type ear protector. One consists of a spring headband to which is attached a pair of muffs constructed of plastic and sponge rubber, which fit over the ears.

The other type consists of a spring headband to which are attached a pair of soft pliable plugs which fit inside the ear canals. The plugs are fabricated before insertion in the ears.

4. Ear valves. This type of protector is an ear filter made of noncorrosive metal and neoprene or soft plastic. When placed in the ear canal, the valve admits conversational tones but automatically closes and protects the inner ear from pressure caused by sudden loud noises or the concussion of explosions. It is more expensive than the simpler ear plug.

Under conditions of extreme noise a combination of ear plug and muff may be worn. This gives superior protection to either device used alone.

The amount of protection offered by good devices varies somewhat with design, and may be considered to be in the range of 25 to 30 db.

ACOUSTICAL BAFFLES hung by wires from ceilings bring down noise levels. They are used where structural treatment cannot be applied. (Sonosorber Corp.)

Individual preferences, as well as ears, differ considerably, so it is advisable to have several types on hand and let the user choose the type.

Well-fitted ear plugs provide protection against sound levels up to 130-135 db. under most circumstances, even when exposure is prolonged and continuous.

II. Medical Control

Where processes are noisy, engineering control methods should be supplemented by medical supervision. A record of each employee's hearing should be kept with periodic tests to detect possible deterioration.

Many companies now measure a new employee's hearing acuity just as they measure his height, weight, vision, blood pressure, etc.

The audiometer is the standard method of testing hearing. This is an instrument which produces tones of the purity and intensity required. One pure tone at a time is presented by headphone to the person under the test. The weakest intensity which he can hear is then found.

The measure of a person's hearing loss is the difference in decibels between the weakest intensity he can hear and the intensity that can just be heard by a person with normal hearing. Another frequency is then selected and the test repeated.

A graph, known as an audiogram, is then plotted. Hearing loss in decibels is plotted on the vertical ordinate against the log frequency on the horizontal ordinate. This gives a quick, accurate picture of the person's hearing acuity in the audible range.

Audiometer tests may be made by trained non-medical personnel. The hearing program, however, should be supervised by a physician.

Routine audiometer tests at regular intervals are advisable in addition to the pre-employment tests.

TABLE II
Common Industrial Noise Levels (Range in Decibels)

Spinners, looms, lathes	80- 95
Screw machines, punch presses, riveters, cut-off saws	90- 95
Planers, routers, sheet metal, speed hammers	110-115
Drop hammers, chipping hammers	110-125

Promoting Ear Protection

Promoting the use of ear protective devices by employees requires the same type of educational campaign that has secured wide acceptance of goggles and safety shoes. Ear protection is comparatively new and its value must be explained.

A doctor, nurse or first aid man might discuss ear protection at safety meetings and show the different types available.

Some companies have found that it helps to have a variety of ear protection devices rather than try to push a single type. Men are advised to try the different types on the job and report back to the safety or medical department. If people have a choice the proposition seems more attractive.

Ear protection must be regarded as a long range educational program. It is aided by posters, articles in employee publications and demonstrations at safety meetings. This selling job can usually be done best by a doctor, nurse or first aid man trained in the handling of ear protection devices.

Some temporary discomfort may be expected at the start but if plugs are too uncomfortable they are not doing the job properly. Individual ear canals differ

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Many industrial accidents have been traced directly to the inability of workers to hear warning signals, the approach of vehicles or equipment. Most of these accidents might have been prevented by a comprehensive Industrial Hearing Test Program.

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in size. A small device might fit a person's left ear while medium-sized one may be indicated for the right ear. Time spent in trying out different types and sizes will help to win acceptance of the program.

Many safety men wear spectacles with protective lenses and safety shoes while on the job. It gives them added authority when they urge employees to protect their eyes and feet. Safety men might also experiment with various types of protection for their own ears. Suggestions based on personal experience are always more convincing. * * *

When a Hearing Aid Is Needed

PERSONS with varying degrees of hearing impairment can work safely and efficiently on many jobs. In other occupations, however, deafness can be a handicap or even a hazard to the individual and his fellow workers. Using the skills of deaf persons is an important phase of rehabilitation.

In this rehabilitation program hearing aids are often of value. Properly fitted, they enable many persons to fill important jobs and live normal lives.

An examination by an otologist is essential. A medical examination will show whether or not hearing loss is correctable by treatment or surgery.

If the ear specialist reports that an instrument is advisable, the patient has two choices. He may visit several dealers and try various instruments. Or, better, he may visit a clinic at a college, hospital, school for the deaf, or one conducted by a specialist or a society for the hard of hearing.

Clinic services, as a rule, are non-medical. They include an audiometric test to determine the extent of hearing loss. Each ear is tested separately for air conduction and bone conduction.

Services may also include hearing aid selection, training in use of an instrument, instruction in lip reading, speech correction, and guidance in personal and employment problems.

Most clinics do not sell hearing aids. Since no one brand can be prescribed for all types of

WITH THESE "hearing glasses" the wearer can hear through both ears, improving hearing quality and enabling him to judge direction and location of sound. Tiny transistors, mercury cell batteries and microphones are contained in temples. (Beltone Hearing Aid Co.)

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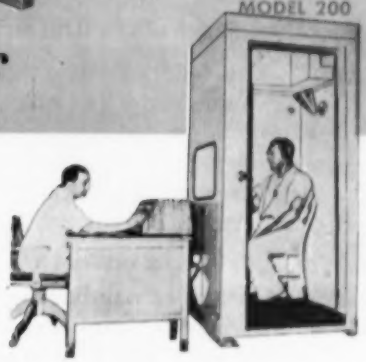
America's first and most complete line of guaranteed clinical audiometric examination rooms*

MODEL 400



MODEL 200

Now you can select the Audiometric Examination Room that *you* need from IAC's complete line! Each room is engineered to give you your required performance—and this performance is guaranteed!

Send the coupon today for full details of IAC Clinical Audiometric Examination Rooms!

**This guarantee made possible by the hundreds of proven installations of IAC rooms now in use!*

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INDUSTRIAL ACOUSTICS COMPANY, INC.

341 Jackson Avenue • New York 54, N. Y.

"Specialists in Noise and Pulsation Control"

Industrial Acoustics Company, Inc. Dept. 20
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New York 54, N. Y.

Gentlemen:

Send complete details of IAC Audiometric Examination rooms to:

Name_____

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"Estimated noise reduction approximately 80%" with TRANSWALL® installation

A plant in Akron had a noise problem . . . a pneumatic coining machine. Management called in an acoustical contractor who recommended an easy, effective and economical solution—an installation featuring Bemis TRANSWALL folding partitions.

The general manager of the firm writes:

"The installation reduced the irritating noise effect on both factory and office personnel. Estimated reduction approximately 80 percent. The material was purchased and installed by factory personnel. The job was accomplished at relatively low cost, the materials costing approximately $180.00."

Improves plant and office economy!

Easy to install!

Low Cost!

TRANSWALL scores extraordinarily high in noise control and fire resistance. It is durable, long-lived, easy to operate, much lighter than comparable walls, and folds to approximately one-tenth of its open length. Due to the simplicity of its ingenious design, the track can be curved to a 24-inch radius if needed. Possibility of damage to TRANSWALL is negligible. *And costs are substantially lower than for any comparable folding walls or doors.*

MAIL THIS COUPON TODAY

TRANSWALL COATED PRODUCTS,
Bemis Bro. Bag Co., 610 4th St. South, Minneapolis 15, Minn.

Please send me complete information on TRANSWALL, including case histories of noise-safe installations.

*Name*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

TRANSWALL Coated Products BEMIS BRO. BAG CO.

hearing loss, the clinic may have 6 to 10 makes of instruments from which to make a selection.

Choice of an instrument may be decided by these factors:

1. *Service.* Does the manufacturer have a representative in the customer's community or in a nearby city?

2. *Cost and convenience.* Standard models may vary in price from $50 to $200. Cost of batteries for the length of time the batteries may be used may be important.

The newer transistor types are compact and economical to operate.

If the dealer does not give an audiometric test, the otologist's report should be presented. If a test is given by the dealer, it should be compared with the otologist's report. Although there is a difference in audiometers, the curve of the test results should be approximately the same.

When trying instruments, these factors should be considered:

—Increased hearing for speech is the objective.

—Speech must not be made uncomfortably loud.

—The wearer should hear comfortably, without sensations of tickle or pain.

—The instrument should have a reserve of power. If speech is barely audible with the volume control turned to the loudest point, the instrument is inadequate.

—Differences between comparable

EMPLOYEE on noisy job is fitted with ear plug by nurse. A comfortable fit is needed to win acceptance for ear protection. (Solar Aircraft Co.)

models of various manufacturers are usually less than the sales talk would indicate.

Important in an air-conduction instrument is the ear insert molded to fit the ear. The mold, made of plastic, is usually included in the price of the instrument.

Proper fit of the ear insert is important. One that fits too loosely will cause a distracting squeal. One that is too tight will be uncomfortable.

Binaural hearing. A person who has normal hearing in one ear and little or none in the other has little difficulty understanding speech in a quiet room. In compensation cases, loss of hearing in one ear is usually rated at only 10 per cent disabling.

The person with one good ear, however, may have difficulty in determining where and how far away sound comes from. There is also decreased ability to understand speech when there is other noise in the room, or when many persons are talking.

QUIET SURROUNDINGS for audiometric tests. Portable booths are also available. (Lockheed Aircraft Corp.)

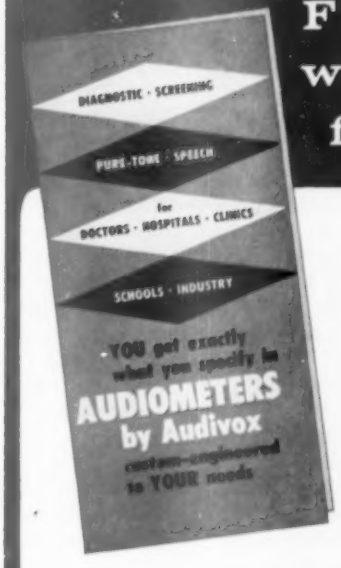
Advantages of binaural hearing are: Localization, discriminative selection, speech sound discrimination, ease of listening, sound identification, and improvement in sound quality.

Recently developed "hearing glasses" enable those with impaired hearing to hear through both ears. Hearing aid circuits are contained inconspicuously in the temples of spectacles. Each temple contains three transistors, a mercury cell battery (smaller in diameter than a dime), printed circuit, microphone and other parts. Each side has separate volume controls.

Learning to use a hearing aid is easy for some persons, but for others it requires patience and persistence. The wearer must learn to accept and interpret both pleasant and unpleasant sounds, just as persons with normal hearing must do.

Users who are most satisfied with their aids are those who wear them all day, every day, seldom varying the volume control.

Helpful information has been compiled in the *Manual of Operation for an Industrial Hearing Conservation Program,* issued by the Committee on Conservation of Hearing, American Academy of Ophthalmology and Otolaryngology, 1136 W. Sixth St., Los Angeles. • • •



FREE FOLDER tells the best way to protect your company from costly deafness claims

YOU MAY SAVE your company thousands of dollars from deafness claims and needless accidents with an Audivox Audiometer. This sensitive instrument to measure the hearing power of your employees is low in initial cost and low in maintenance cost, it's compact and light, it's simple to operate, and will give years of trouble-free, accurate service. Write for free folder, *today.*

AUDIOMETERS BY

audivox

SUCCESSORS TO *Western Electric* HEARING AID DIVISION

Audivox, Inc., Dept. SJ2,
123 Worcester St., Boston, Mass.

Gentlemen:

Please send me the free folder with detailed information about Audivox Audiometers.

Name .....

Firm .....

Street .....

City ..... *Zone* ... *State* .....

Jets vs. Ears

Excerpts from an address before a joint meeting of the Industrial Medical Association and the American Association of Industrial Nurses by Sherman M. Williamson, M. D., Boeing Aircraft Company.

IT IS THE RESPONSIBILITY of the industrial physician to protect the employee from hearing loss caused by exposure to industrial noise. To discharge this responsibility he must evaluate his plant to see if a noise problem exists and what type of noise is involved:

1. Is it a constant rumbling of general factory noise or are there sharp peaks of loud noise?
2. Is noise continuous or interrupted?
3. Are there sudden impacts that cause the noise?
4. Of what intensity is the noise?

The acoustical engineer can determine the noise level and type of noise in areas that the physician feels are critical. The engineer must determine whether it is feasible to treat acoustically the area involved, and whether it is possible to treat a noisy machine to decrease noise at its source.

Acoustical treatment may solve the problem. If not, the physician must recommend the type of personal protective equipment to be used.

A personal protective device must give attenuation to the point where the noise (sound pressure level) does not cause damage. Protection must be for both high and low frequencies. In our experience there are three main groups to consider in affording personal protection:

1. Riveting and production (includes saw operators, spindle shapers, etc.). Noise in such areas may be fairly constant, with peaks in the immediate vicinity of the operator. Ear plugs offer adequate protection in these areas, if worn. To be effective, plugs must be fitted to the individual.

2. Hammer shops. Noise for a hammer operator is greatest at the time of impact of the hammer, but with a large battery of these machines, the over-all noise level is rather constant. The old-time operator may consider it a badge of his trade to be somewhat hard of hearing and will resist wearing protective devices.

3. Jet engines. This is the area of highest noise (sound pressure) levels. All available commercial types of protective devices have been tested but do not give adequate protection against jet noise at full power. Sound pressure level around the J57 jet engine is 130-140 db. at 100 per cent power. With afterburner attached to the J57, levels of 160 db. are recorded.

Plugs, muffs and most other devices give a rather good degree of attenuation for high frequencies. With ear plugs plus helmet-muff (the best protection yet available), hearing loss may still occur in some persons exposed to 130-140 db.

Selection of protective devices must be based on the type of noise exposure. Educating the worker to use of protective de-

NEW
PRESSURE EQUALIZED
SEPCO EAR PROTECTORS

SEPCO'S actually absorb "danger area" noise, reducing it to a safe level.
SEPCO'S provide ventilation to the inner ear — no annoying pressure to cause dizziness. Yet the scientifically baffled vents do not reduce their effectiveness.
SEPCO'S wedging action assures proper fit.
SEPCO'S offer maximum comfort — may be worn for long periods.
SEPCO'S are soft and mold to the ear canal to form a perfect seal.
NOTE: vents & special noise absorbing filler
SOFT molds itself to the ear
The advanced design of Sepco Ear Protectors represents months of audiometric research into the characteristics of noise-induced hearing loss. They offer proved and controlled protection. Filled with a radically new noise absorbing material, and incorporating pressure equalizing vents, these protectors filter out harmful sound and eliminate that "plugged" feeling and the dizziness or vertigo caused by stopping the ears with a common plug.
SEPCOS are not merely rubber ear stoppers or plugs. They are laboratory tested, scientifically designed and manufactured noise reduction devices!!!
SAFETY EAR PROTECTOR COMPANY
2622 So. Robertson Blvd., Los Angeles 34, California
SEPCO
DEALERSHIPS AVAILABLE • FREE SAMPLE WHEN REQUESTED ON COMPANY STATIONERY

STOP FACTORY NOISE
OVER MOVING MACHINERY...
reduce fatigue and tensions
INCREASE EFFICIENCY WITH
SONOSORBER*
GUARANTEED RESULTS! FREE ENGINEERING SURVEY, ANALYSIS and ESTIMATES. *Write Today.*
ELOF HANSSON, INC. ACOUSTICAL DEPT. NS 3-7
711 THIRD AVENUE, NEW YORK 17, N. Y.
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now you can

Protect Against Costly Damage Suits for Loss of Hearing

Maico MA-2 PORTABLE AUDIOMETER

Another Essential in Your "Safety Check" Program

FREE BOOK

Send for free booklet to help you better understand how a Hearing Conservation program can be profitable to your firm.

Now give pre-employment and periodic hearing tests with Maico's new, simplified Audiometer. Plant nurse or a member of personnel department can easily test hearing by following simple instructions. It's ideal for either routine hearing tests or thorough hearing analysis. Because it is lightweight and portable, it can be quickly carried from department to department or from plant to plant. Your plant safety program is not complete without a hearing test program.

MAICO 21 North 3rd Street, Minneapolis, Minnesota Room 87K

Please send free booklet "Ears and Industry" and more details about Maico Audiometers.

Name of company _____

Address _____

City _____ State _____

Attention: _____

vices is the first step in the program. The foreman must be educated first; it is obvious that the program will fail if he tells his subordinates he has been in noise for years and still hears well.

Many employees will not wear ear plugs unless forced to do so. Busy foremen cannot be expected to patrol noisy areas looking in ears for plugs that are almost invisible. The physician can't be too enthusiastic about enforcing constant wearing of a device which can be uncomfortable, which can cause sensitization, or which cannot be worn in the presence of a draining middle ear. Management is concerned that an unpopular edict may injure employee relations. Nevertheless, hearing protection must be afforded.

Protective Devices

Ear plugs should be smooth, have no abrasive action on the external canal, be non-sensitizing, easy to clean, and as comfortable as possible. They must be fitted to the individual by a trained technician. At present we are using the V-51-R type ear plug and find it perhaps the most widely accepted.

Some waxed cotton plugs are used to fit the variant ear canal.

Muffs should fit snugly to the head and be free of projections which can catch on machinery and structures. They must clean easily and not cause undue pressure symptoms or perspiration at contact points.

Helmets reduce sound energy transmitted to the bones of the head. The face should be covered for maximum effectiveness. The firm type of helmet, similar to a football or crash helmet, is rather cumbersome, expensive, warm, and hard to get on and off. Soft cloth helmets containing various types of muffs are more comfortable and do an adequate job of attenuation at moderate noise levels.

Combination of ear plugs and helmet gives more protection than either alone and must be used to protect against intimate exposure to jet noise.

After the program has been set up, the physician must discover whether the measures are effective. By audiometric readings he will be able to determine the effectiveness of the protective devices. The audiogram must be performed prior to initial noise exposure and repeated at intervals determined by the findings and the level of the noise exposure.

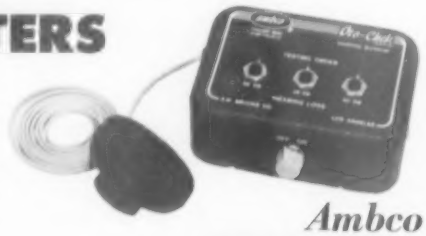
One must evaluate any hearing loss by taking into consideration the history and previous noise exposure of each person in a noisy area. Don't blame the hearing loss of the ex-artilleryman on the noise in your plant.

Careful pre-employment and periodic audiograms will soon detect progressive hearing loss and thereby assist in revealing the effectiveness of your protective devices. Audiograms will reveal whether ear plugs are being worn, even in more moderate noise level areas. The fact that one can determine this from valid audiograms alone puts pressure on employees to comply with plant regulations on the wearing of plugs. * * *

AUDIOMETERS

to quickly determine
Hearing
Impairment

Two new instruments —each performing a valuable function in industrial safety programs.



Ambco
OTO-CHEK

Simple to operate . . . especially designed for large scale screening in industry . . . for rapidly determining the presence or absence of a hearing loss.

•

Ambco
OTOMETER

The Otometer is a threshold air conduction screening audiometer . . . for measuring the *degree* of hearing loss.

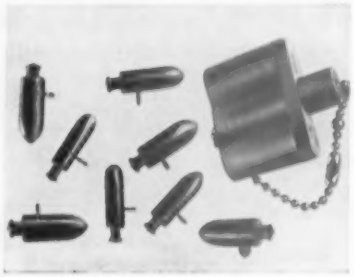
•

Both instruments are battery operated, featuring

LOW COST
LIGHT IN WEIGHT

We invite you to write for free descriptive and technical brochure.

AMBCO, INC.
(formerly A. M. Brooks Company)
Mfrs. of Quality Auditory Equipment
1222 W. WASHINGTON BLVD., LOS ANGELES 7, CALIF.



CUT DOWN NOISE
WITH THE SMR
EARSTOPPER

Soft, comfortable, resilient, the SMR EAR STOPPER adjusts itself to all shapes, turns and movements of the ear canal. Tends to anchor itself in the ear. Has a long life and is reasonable in cost. Furnished in a plastic case. Forty-five cents per set in gross lots.

SURGICAL MECHANICAL RESEARCH INC.
1905 Beverly Blvd., L. A. 57, Calif.

SMR

Free sample when requested on company stationery.

IN THIS SECTION

Eye Conservation 92

Head Protection 101

Respiratory Protection (Data Sheet D-444) 9

Filter Glasses for Air Line Pilots 126

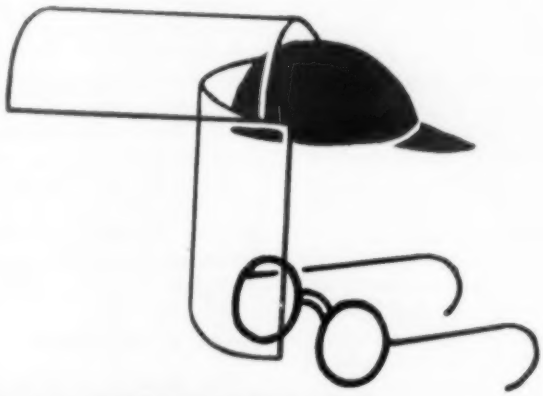
• • •

WHERE removal of hazards at the source has not been practicable, for brief, temporary exposures, and for emergency situations, personal protective equipment provides a second line of defense.

The record of these devices in preventing serious injury—and sometimes death—is impressive. Membership in the "Wise Owl Club," composed of employees whose eyes have been saved by goggles or shields, recently passed the 10,000 mark.

Because of its size and scope, the section on Personal Protection has been divided into two parts. Part 1 deals with protection for the eyes, head and respiratory organs.

Information on respiratory protection will be found in Data Sheet D-444, *Respiratory Protective Equipment*, on pages 9-14. This data sheet presents in somewhat greater detail the material usually found in an article on the subject in this section.



5

PERSONAL PROTECTION PART I

Eye Conservation

The complete program includes

Protection of eyes and face against injury

Detection and correction of visual defects

LOSS OF EYESIGHT is one of the most tragic and costly of injuries—to the individual, to industry, and to society. Eye protection, therefore, has a prominent place in accident-prevention programs.

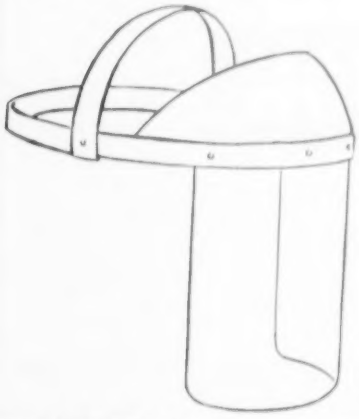
Some companies have been successful in establishing 100 per cent eye protection—goggles or face shields for every employee in every department and for visitors, too. Others make eye protection compulsory only on certain operations.

Some companies have been so successful in selling eye protection that many employees wouldn't think of driving a nail at home without wearing goggles.

Also important is examination of vision before employment, both as an aid to placement and to enable the employee to have defects corrected in the interests of safety and job efficiency.

Evaluating Eyesight

For pre-employment examinations, it is important to know the visual status of each applicant.



FACE SHIELDS of transparent plastic protect both eyes and face against light impact.

Examinations of large numbers of employees can be made quickly with screening devices now on the market. These detect substandard vision and appraise visual skills for various jobs. They do not diagnose specific defects.

Three screening devices are now available. All three have been in use for years and have proved satisfactory. Two may be purchased while the third can be obtained only on lease.

Scoring cards are provided with the instruments and service includes instruction in testing and evaluating results.

The tests take five minutes or less and may be given by trained laymen. Employees needing visual correction are referred to ophthalmologists or optometrists.

Types of Protection

For protecting eyes and face against various occupational hazzards, four general types of equipment are used:

1. Goggles (safety glasses)
2. Face shields
3. Welding masks and helmets
4. Acid hoods

For detailed list and descriptions of various items of equipment for eye, head and respiratory protection, see accompanying definitions from *National Bureau of Standards Handbook H24.*

Corrective lenses. For visual defects, the wearer may have the correction ground in heat-treated lenses, or cover goggles may be worn over spectacles.

For optical reasons as well as convenience, corrective goggles are preferred. Most prescriptions can be ground in impact-resisting glass and in the improved plastics. Safety glasses will, of course, be heavier than ordinary spectacles.

In prescribing corrective lenses for goggles or for ordinary spectacles, the refractionist should be familiar with the job. It is particularly important to know the distance of the work level from the eye.

Cover goggles are often preferred where the correction is complicated and expensive lenses would be subject to pitting on the job. They also have advantages where a near-sighted person requires deep minus lenses. These might be excessively thick at the edges yet too thin for adequate protection at the center.

Cover goggles are available in the cup type with heat-treated glass lenses and the wide-vision type with plastic lenses.

Types of Goggles

Safety glasses are available in many types for practically every occupation. The protective medium may be heat-treated glass, transparent plastic, wire screen, or light-filtering glass.

Heat-treated lenses in spectacle frames, or cup goggles offer basic protection. The nature of the job and its eye hazards determine the specifications.

Spectacle goggles are worn for light or moderately heavy work, such as grinding, machine work and assembling where working positions are not too close.

The frame must be rigid enough to hold the lenses in position in front of the eyes. The nose bridge should be adjustable, or goggles should be available in enough sizes to fit various faces.

Side shields of metal or plastic provide protection against light objects flying from the side. They

PLASTIC lenses are lightweight and will withstand considerable impact.

should be used where operations are close together, or where employees work together on the same operation.

Cup goggles are used for heavy grinding, machining, chipping, riveting, work with molten metals, and similar operations.

The cup should be wide enough to protect the eye socket and distribute the impact from any blow over a wide area. The cup should be flame-proof, corrosion resisting, and non-irritating to the skin.

Mask-type goggles, with frames of soft vinyl or rubber, offer protection against splashes of corrosive chemicals and exposure to fine dust. This type is obtainable with lenses of heat-treated or untreated glass or acid-resistant plastic. Some types may be worn over spectacles. Ventilated types are less troubled by fogging.

Dust goggles, leather mask type, for non-corrosive dusts, are made with heat-treated, untreated or filter lenses. Wire screen ventilators around the eye cup provide air circulation.

Miners' goggles of corrosion-resisting wire screen are used for work underground and in other locations where fogging is a serious problem. The screen is coated a dull black to reduce reflection.

Plastic lenses, greatly improved in recent years, have qualities of optical glass in light transmission and freedom from distortion. Corrections may be ground in them. They are light in weight and resist fogging. They are useful for spotwelding, as molten metal does not adhere to plastic as readily as to glass.

Plastic withstands considerable

EYE PROTECTION FOR VARIOUS JOBS

TYPES OF EXPOSURE (National Bureau of Standards Handbook H24)	TYPES OF PROTECTION									
	CUP GOGGLES	SPECTACLES	SIDE SHIELDS	PLASTIC EYE SHIELD	PLASTIC FACE SHIELD	WIRE SCREEN SHIELD	FILTER LENSES	RUBBER OR VINYL GOGGLES	HOODS	WELDING HELMETS
Heavy impact, large particles—Chipping, calking, some riveting operations, sledging in quarries.	•		•							
Moderate impact, dust and small flying particles—Scaling and grinding metals, stone dressing where quartz is not involved, some woodworking operations.		•	•	•	•					
Metal sparks and spatter — Electric spot and butt welding; no exposure to excessive energy or glare.			•	•	•					
Splashing metal—Babbitting, pouring lead joints for pipes, casting hot metal, dipping in hot metal baths.	•			•	•	•				
Splashing liquids—Acids and caustics, dipping in galvanized tanks, some japanning operations.	•				•			•	•	
Reflected light and glare — Long exposure to light reflected from snow, water, roads, etc.; incidental glare from furnaces, working near acetylene welding, etc.	•	•	•				•			
Injurious radiant energy—Moderate reduction in visible radiant energy—Oxyacetylene welding and cutting.	•						•			
Injurious radiant energy—Large reduction of visible radiant energy—Arc welding.										•

COVER GOGGLES
for all-around protection

SOFT VINYL FRAMES

. . . safe, comfortable, form-fit

Stac-Vent (SV) Ventilation provides clear, fog-free vision — greater protection. Also: regular (RV), screen (CV) or no (NV) ventilation.

HEAVY IMPACT PROTECTION

Replaceable, optically perfect methacrylate lenses in models 440 SV (clear frame) and 460 SV (green frame). Clear (C) lens is .125" thick; light (G2), medium (G4) and dark (G6) green lenses are .080" thick. Lenses meet Federal Specifications for "drop ball" and "drop needle" tests.

AVERAGE IMPACT PROTECTION

Replaceable, optically perfect acetate lenses in models 441 SV (clear frame) and 461 SV (green frame). Clear (AC) lens is .060" thick; green lens (AG) is .050" thick.

Soft Vinyl Frame Goggles Fit Over Any Prescription Frame

SOFT VINYL BLACK FRAME

Opaque black frames with methacrylate (Model 490) or acetate (Model 491) lenses. Stac-Vent ventilation only. Lenses available in medium (G4) or dark (G6) green.

WELDING GOGGLES

Welding goggle (Model 492) with removable lens holder. Replaceable standard 50 mm round, Federal Specifications welding filters available in shades 3, 4, 5 and 6. Glass filters inside and outside protected by acetate cover lenses.

MOLDED FRAME COVER GOGGLES

Molded Curved (Models 7 and 27) and Molded Square (Models 1-N regular and 30 extra large). Fit over most metal frame and rimless glasses. Frames available in crystal, green or black. Replaceable methacrylate lenses in clear (C), light green (G2), medium green (G4) and dark green (G6).

SAFETY SPECTACLES
light, comfortable protection

TUC-AWAYS

. . . featherlight and safe

HEAVY DUTY METHACRYLATE LENSES are optically perfect, .105"-.115" thick for impact protection. They will not shatter or pit. Lenses provide full, clear vision with side shield or cup type side and bottom protection. Meet Federal Specifications for "drop ball" and "drop needle" tests.

ONE SIZE FITS ALL WORKERS. Wearer adjusts and maintains his own spectacles. Universal nosepiece and adjustable Retrax Temples assure perfect fit.

Choice of 3 Temple Styles

TUC-AWAYS		VISOR TUC
Model 415	Plastic Retrax Temples	Model 425
Model 412	Metal Retrax Temples	Model 422
Model 410	Plastic Club Temples	Model 420

VISOR TUCS

. . . over eyes protection

All the features of Tuc-Aways plus over-eyes visor protection from glare and flying particles. Visor fits comfortably against forehead.

Quality Eye Protective Equipment — *Made by the Leaders in Plastics*

WATCHEMOKET eye SAVERS

ONE PIECE ACETATE GOGGLES

Close fitting for maximum protection and comfort. Optically correct, full, all-around vision — no distortion of image through lens area. Cheepee Model 99 is medium size .040" thick acetate goggles. D-Lux Model 100 is extra large size .050" thick acetate goggles.

METHASPEC EYE SHIELDS

Ideal for visitors' protection. Lens and visor molded in one piece, formed of optically perfect .080" thick methacrylate in clear (C) with black painted visor, light green (G2) and medium green (G4). Retrax temple and lens angling device permit easy adjustment — comfortable fit. Model 55.

SPLIT-JOINT SPECTACLES

Split-Joint plastic frame enables quick, easy lens replacement. Plastic Retrax Temples telescope in and out for perfect fit. Double bridge design increases strength of frame. Model 80 is frame only, furnished for prescription use with standard 47 mm P-3 shape lenses. Model 80 MS is frame and optically perfect, curved, methacrylate, plano lenses, .080" thick.

AIR SPEC VISITORS' SPECTACLES

New low-cost safety spectacles for visitors' use. Cast acrylic lenses provide excellent protection. Nylon frame is virtually unbreakable. Entire spectacle is light and comfortable — weighs less than an ounce. Model #201. Has highly styled Club Temples.

SAFETY CLIP-ONS

Featherlight Tuc-Overs are all plastic with integral visor protection. Clip on prescription glasses for protection against medium impact, glare and sparks which might pit the glass lenses. Model 175 (Medium), Model 176 (Large). Both models are available with either the new "orbital" lenses or dropeye lenses. Frames are available in translucent white or green.

EXECUTIVE SAFETY SPECTACLES

Handsome, lightweight frame curved to fit forehead. Optically perfect, curved, methacrylate lenses snap-in and snap-out for easy replacement. Model 595 has Metal Retrax Temples, Model 590 has Club Temples. Furnished with protective case.

WATCHEMOKET OPTICAL CO., INC.

232 WEST EXCHANGE ST., PROVIDENCE 3, R. I.

In Canada: Levin-Safety Limited, Toronto 10, Montreal 26, Winnipeg

WISE OWL CLUBS now have thousands of members in plants all over the country—workers whose eyes have been saved by goggles or shields. This display is one of promotional methods used at Diamond Alkali Company.

impact but is marred or scratched more easily than glass.

Plastic lenses should be cleaned with liquid cleaners and soft tissues rather than silicone-treated tissues.

Important considerations. Ease of cleaning and sterilization is essential. Most types on the market meet these requirements.

Goggles should be fitted as close to the eyes as possible without touching the eyelashes to give the widest possible angle of vision.

Minimum permissible size for oval lenses is 44.5 mm. in the vertical dimension and 48 mm. in the horizontal. Round lenses should be 50 mm. in diameter.

Lenses should have no appreciable distortion or prism effect.

Strength of heat-treated lenses (resistance to impact) should conform to specifications of the Federal Standard Stock Catalog, the government's official purchasing guide, Specification GGG-G-G-501B.

Sweatbands, worn across the forehead in hot, humid locations, help prevent fogging of goggles and spectacles.

Non-fogging compounds, applied to the lenses, help to keep the glass clear.

Face Shields

Face shields of transparent plastic give eye and face protection on such jobs as metal-sawing, working with chemicals, buffing, sanding, light grinding, bottle manufacturing, etc.

They should not be used for welding, heavy grinding or where resistance to severe impact is necessary. Shields may be worn over spectacles.

Wire mesh shields are used for pouring low-melting point metals, as in babbitting. The mesh stops splashes of metal and allows better ventilation than a solid shield.

Hoods and Helmets

Hoods (loose-fitting) and **helmets** (rigid frame) of various types are worn to protect the face and head against hazards which do not involve heavy impact.

These are equipped with windows but goggles may be worn underneath. If toxic fumes, dusts or gases are encountered, an air line should be supplied. As these hoods are rather warm, an air line may also be desirable for comfort.

SIDESHIELDS add to the protection provided by spectacle type goggles.

Fabric hoods protect the wearer from nuisance dusts, paint spray, etc.

Fire-resistant duck and asbestos hoods are used for varying degrees of exposure of heat, as in furnace and burning operations and fire fighting.

Hoods and helmets of rubber, neoprene, plastic film, and fabric impregnated with rubber or plastic provide protection against splashes of acids, caustics, organic solvents, etc. Not all of these materials are resistant to all exposures and the manufacturer should be consulted.

References—Eye Conservation

National Safety Council: Accident Prevention Manual for Industrial Operations, 1955.

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National Safety News: Safety Eyewear, Good Practice and Malpractice; Hedwig S. Kuhn, M. D., Sept. 1950.

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—Rays That Injure Eyes; A. L. Koven, M. D., Feb. 1954.

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—Investment in Protection; June 1954.

—Facts and Fallacies About Your Eyes; Hedwig S. Kuhn, M. D., July 1954.

—Protection Plus Correction; Herman Sager, O. D., Dec. 1954.

—Do It Yourself, But Protect Your Eyes; Apr. 1955.

—Your Plant Can Have Better Vision; Aug. 1956.

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—Spectral-Transmissive Properties of Plastics for Use in Eye Protection, Z2 Report.

Dockson HELMETS

COMFORTABLE

STURDILY BUILT

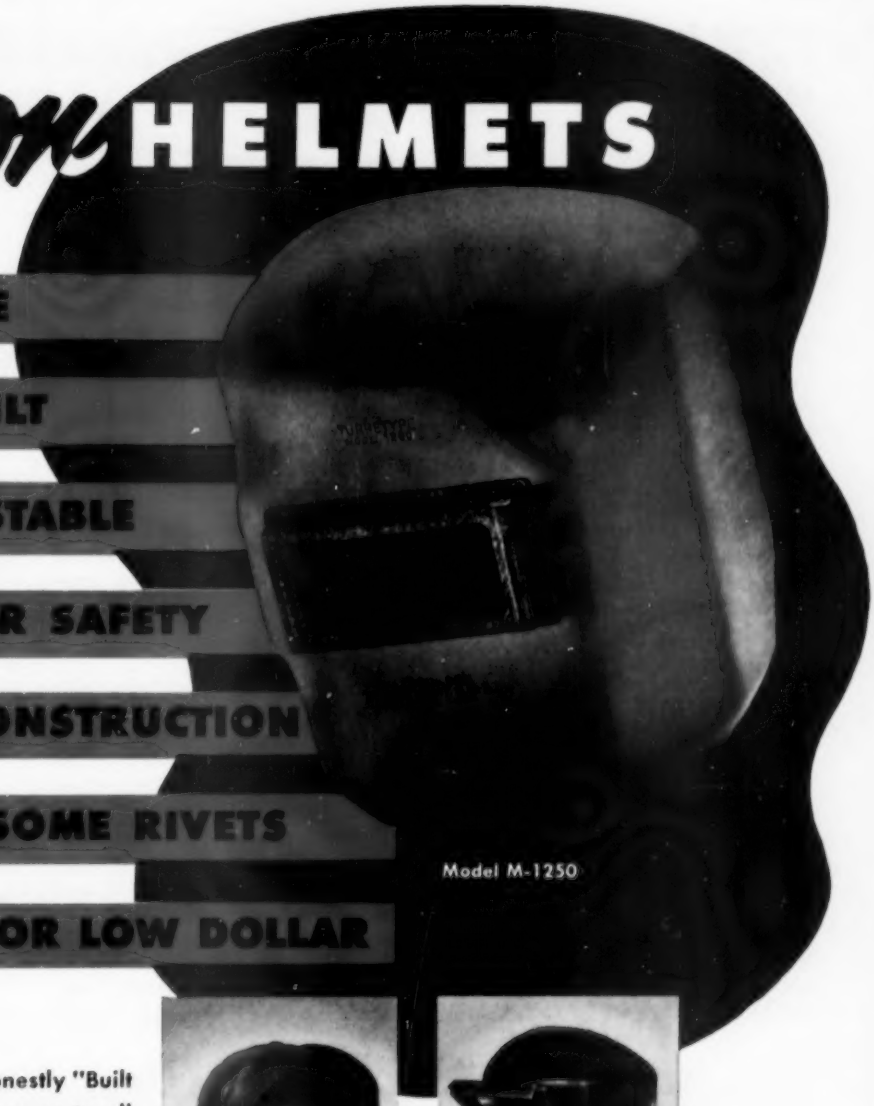
EASILY ADJUSTABLE

DESIGNED FOR SAFETY

ONE PIECE CONSTRUCTION

NO TROUBLESOME RIVETS

HIGH VALUE FOR LOW DOLLAR



Model M-1250

Dockson Helmets are honestly "Built for better service." They incorporate all the outstanding comfort and safety features which have made Dockson an important name in safety equipment.

Quality built, light, rugged, fully adjustable. Fitted with Federal specification plates of your choice. Headgear designed for comfort and long service.

You'll get more for your money with Dockson Better Built Equipment.

Write for complete Safety Equipment Catalog.

Model 1250-80

Model 1750

Model 1225

Model 1450

Dockson CORPORATION

3839 WABASH AVE. • DETROIT 8, MICH.

Harmful Rays

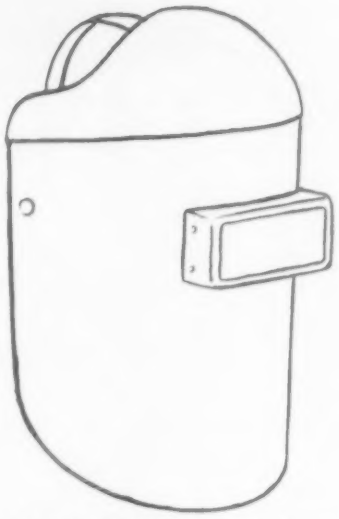
Glass which filters out harmful ultraviolet and infrared rays is available in many types of goggles, face shields and helmets. These filter lenses are worn for welding and cutting, furnace and boiler observation and other operations where there are high temperatures and excessive glare.

Didymium glass is used for protection against bright yellow encountered in glass blowing and similar operations. It is also useful for some precision operations in laboratories.

Melters' goggles of cobalt blue glass come in spectacle and cup types in graded shades. Lenses with color in the upper half and clear glass in the lower half are also obtainable.

Sun glasses are not effective ray-filter glasses for most industrial exposures. They are designed for protection against discomfort caused by sun glare. The better glasses conform to optical standards but many of the cheaper ones show considerable distortion.

Welding helmets provide protection for the eyes and face under the severe conditions of arc welding. They are attached to headgear so they can be raised for placing the work. Impact goggles worn under the helmet provide protection when the helmet is raised.



WELDING HELMETS of dielectric fiber with low heat conductivity resist sparks, molten metal splashes and flying particles. Cover glass protects filter plate.

Helmets are made of dielectric fiber resistant to sparks, molten metal and flying particles, and having low heat conductivity. Replaceable cover glass protects filter plate.

Some helmets have a lift-front glass holder which permits rapid inspection of work without removing helmet.

Welding hand shields are used on operations where a helmet is not practical, and on tack welding, set-up work, inspection and time study work. Construction is similar to welding helmets.

Filter Lenses. The following shade numbers are listed in National Bureau of Standards Handbook H24:

No. 3—For protection against glare or reflected light, spot welding operations, light brazing.

No. 4 or No. 5—Light acetylene cutting and burning.

No. 6—General acetylene welding, or welder's helper or set up on arc welding.

No. 8—Heavy acetylene welding or cutting, or very light arc welding.

No. 10—Arc welding up to 250 amperes.

No. 12—Arc welding of more than 250 amperes, atomic hydrogen welding.

No. 14.—Carbon arc welding.

Goggles are available in shades up to No. 8; higher numbers in helmets.

Heat-treated cover lenses can be provided to protect filter lenses against pitting and scratching. Heat-treated filter lenses are also available.

Administering the Program

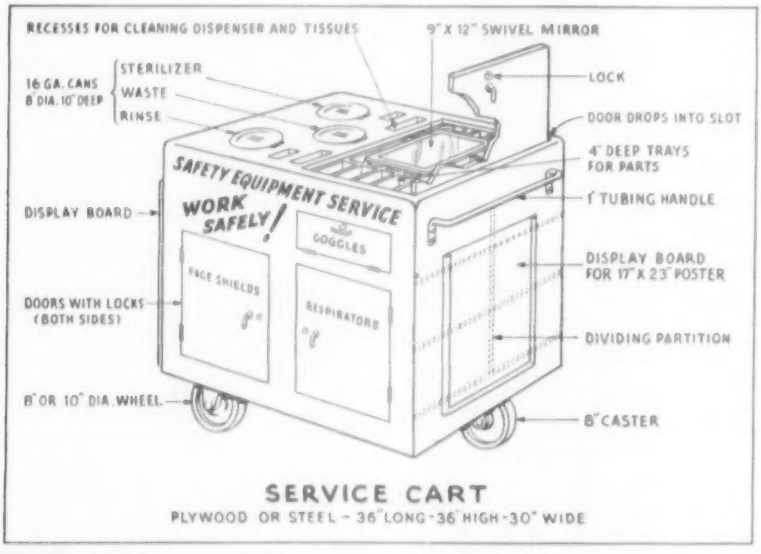
Supply and distribution. In some companies the supply is kept in the main supply department. In larger plants a supply of goggles and repair parts may be kept in each shop.

Some operate goggle carts with trained attendants who make the rounds, cleaning, adjusting, repairing and replacing goggles on the job.

Fitting. Prescription glasses should be fitted by a refractionist. Fitting plano goggles also requires training and experience. Many optical companies offer instruction in this work. Unless goggles are fitted properly there will be opposition to eye protection.

Cleaning and sterilizing. Both

—*To page 112*



MOBILE service cart equipped for cleaning, sterilizing and adjusting goggles, face shields and respirators. The cart tours the plant, servicing equipment on the job.

INTERDEPARTMENTAL MEMORANDUM

How safe are Hard Hats under field conditions? Read the answer in this important memorandum...

TO: Paul O'Donnell

FROM: E. W. Bullard, Jr.

BULLARD
INDUSTRIAL SAFETY EQUIPMENT
Sausalito
California

Paul, here are results summarized from Report B1-R6 from Research Laboratories, of field-type tests of ten different kinds* of safety hats, conducted in October, 1956.

HELMET COMPARATIVE IMPACT PERFORMANCE DATA
FIELD TYPE TESTS
(8 lb. drop ball test)

Only Bullard Hardboiled Hats are able to safely reach 40 ft. lbs. →

Hat qualifies if shell crown does not bottom out on head.

MAXIMUM IMPACTING FORCE REACHED WITHOUT BOTTOMING OUT

Hat is eliminated if crown bottoms out on head, transferring force to top of skull... this can cause concussion or fracture.

Paul, these tests were run strictly in accordance with Federal Specs GGG-H-142b, with one *variation* that makes this test a closer approximation of field conditions. I'll explain later. The graph shows peak performance of each kind of hat... that is, the maximum impact it would take without allowing the force *to be transferred to* the top of the skull.

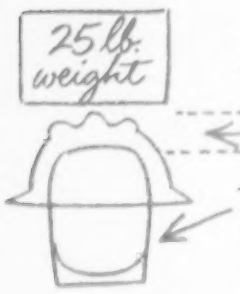
You may run into skeptics when you show this report, so here is how you can duplicate these *field type* tests yourself...

***36 new hats of 10 different types, representing 9 manufacturers, were tested.*

Evaluate your safety hats under simulated field conditions. Here's the method used by a leading researcher.

(Memo to Paul O'Donnell, continued)

As you know, Paul, Federal Specs require that before you run drop ball tests, hats must be adjusted so there *is* 1¼ inches between the top of the head block and the top of the inside of the hat's crown. This is called crown clearance. The adjustment is made with a 25 lb. dead weight on top of the hat.



I'm not an artist but this is what it looks like...

THIS ISN'T REALISTIC IS IT!

Take the weight off and the hat pops up so crown clearance is as much as 1¾ inches. Any safety man knows — in the field, men adjust hats for comfort... so they won't be knocked or blown off... and that adjustment is much less than 1¾ inches. In fact, this independent lab did a study and proved it! *Previous reports from them have shown the average crown clearance for a group of 44 hats, adjusted according to Federal Specs, to be 1.70 inches, whereas a survey of 60 hats being worn in the field showed the average crown clearance to be only 1.09 inches!*

The only difference between these tests and conventional tests is that the crown clearance is adjusted to 1¼ inches without the 25 lb. weight to more closely duplicate field conditions. Let your customers test hats this way. Let them see how much protection their men are actually getting... not how hats perform under artificial laboratory conditions! Let me know what reaction you get.

Ed

Ed...
Have shown this memo to half a dozen key safety directors, They are as impressed as I. Why not publish it in our ads... Let's show everyone why they are safer in Bullard "Three Ribbed" hats and caps. my best to you and your family Paul

BULLARD
INDUSTRIAL SAFETY EQUIPMENT

Write E. D. BULLARD COMPANY, 2680 Bridgeway, Sausalito, California, for complete copies of this report on COMPARATIVE PERFORMANCE OF PROTECTIVE HELMETS

Head Protection

HEAD INJURIES caused by falling objects are a serious hazard in many industries and the hard hat, first introduced in mines some 35 years ago, and constantly improved since then, has an impressive record of lives saved. Head protection has become standard practice in other industries, including construction, logging, shipbuilding, and many types of maintenance work.

Head protection is also becoming general among public utility companies where linemen wear protective hats for protection against live wires overhead as well as against impact.

Protective hats are also useful where there is danger of bumping the head against overhead structures.

Wearing protective hats is included in many labor contracts and the unions have helped in educating their members on the need for head protection.

Requirements. A protective hat should have these qualities:

1. Resistance against impact.
2. Resistance to fire.
3. Resistance to moisture.
4. Light weight
5. Insulation against electricity around live equipment.

Types. The type in general use has a brim all the way around, protecting the head, face and back of the neck.

The cap type is sometimes preferred where a brim might be in the way.

Some models have brackets to support miners' cap lamps or welding masks.

Construction

Materials most widely used are laminated plastic, glass fiber, and aluminum alloy.

Laminated plastic molded under high pressure provides a hat that resists impact and effects of water and oil. It provides effective insulation against electricity.

Glass fiber impregnated with resin has a high-strength-weight ratio, high dielectric strength and resistance to moisture, caustics, and acids.

Aluminum alloy is light in weight and meets all requirements for resistance to impact and moisture, but it is a good conductor of electricity. Metal hats do not meet specifications for all industries and should not be worn where there is danger of electrical contact.

Hats which glow in the dark, due to a phosphorescent pigment, are obtainable on special order.

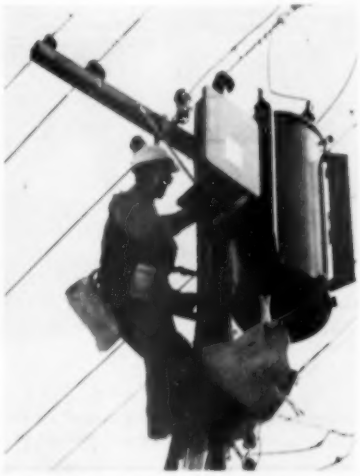
The hard shell of the hat is supported by a cradle or hammock which keeps the shell away from the hat, cushions it against blows, and permits circulation of air around the head.

Cradle and sweatband should be replaceable because of deterioration through perspiration. This is important for sanitary reasons, since hats may be worn by more than one person. The shell can be sterilized by any of the common methods.

For cold weather a lining of water-resistant cloth may be attached to the hat to protect head, neck and ears.

On locations exposed to strong winds, such as bridges and oil derricks, a chin strap is useful.

An eyeshield of transparent plastic may be attached to some types of hats. It is hinged under the peak and lies flat against the peak when not in use.



LINEMAN wearing safety belt and strap, hard hat with winter liner services control panel of pole-top regulator. Tools are carried in pouch attached to belt. Since this picture was taken, control panels have been mounted 10 ft. from the ground and can be reached with a stepladder.

Weight. A maximum of 14½ oz. for the complete hat is specified by Federal Specifications No. 367A (U.S. Treasury Department, Procurement Division). The specification also lists tests which hats must pass. These include moisture, impact and electricity.

Work caps. Where protection against impact is not required, light cloth caps are worn to protect the hair against paint splashes, dust, oil and other non-corrosive substances.

Disposable work caps of heavy Kraft paper treated with neoprene, and a flame retardant are available. The material is water-repellant and resistant to acids and alkalis. Cost is about 30 per cent less than most cloth caps.

Colors. Hats are now available in seven standard colors—white, gray, red, green, blue, brown and black. Other colors are available on special order. Color is permanent because it goes all the way through the material.

Special colors are sometimes ordered, or stock hats painted, to match the color used by the company on vehicles, in advertising, etc.

Distinctive colors and designs are also used to designate the wearer's department or trade. This is often done in plants where certain areas are restricted to authorized employees.

No standards have yet been compiled for the use of color for identification of the wearer. Many civil defense groups have established codes and some industries have adopted similar plans. Typical of these is the code developed by the Higgins Company, New Orleans:

Red—Pipe workers

Blue—Fitters

—*To page 106*

USSSCO..the Complete Line

Industry's Newest, **STRONGEST,**
Most Popular
Safety Spectacle

THE USSSCO
S-7 SAF-I-SPECTACLE

Your Choice:
Plastic Frames in Bronze or Flesh
4 Eye Sizes, 5 Bridge Widths
Spatula or Riding Bow Cable Temples
Integral or Adjustable Nose Pads
With or Without Side Shields
OPTILITE® or Hardened Glass Lenses

Greater Strength— in a new straight-line design — stronger eye wires — stronger and more rigid bridge. These sturdy frames hold their alignment, recover their original shape after severe stress. No permanent distortion to cause "prism effect", or "propeller twisting".

Frames Completely Redesigned and Restyled— around the new S-7 interchangeable lens shape. Smart, up-to-the-minute styling that appeals to both men and women. New lightweight wearing comfort — with OPTILITE lenses, spectacle weighs only 1⅛ ounces.

Higher Impact Lenses— in USSSCO's new OPTILITE lens material — twice the strength but only half the weight of hardened safety glass — non-shattering — superior resistance to pitting and fogging.

HARDENED SAFETY GLASS ALSO AVAILABLE
Stronger eye wires, with deeper molded lens channels, lock lenses securely against impacts.

Straight-Line Design— Increased thickness, strength and rigidity along the top of the frame, in a straight line from end-piece to end-piece.

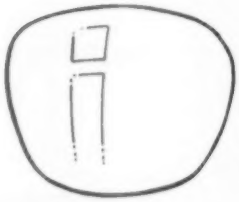
USSSCO SAF-I-SPECTACLES ALSO AVAILABLE WITH S-4 OR P-3 LENS SHAPES

Pioneers in Modern Industrial Eye Wear

℞ *Lenses supplied with or without correction—to individual prescription, single vision or multifocals —or in Plano— in EITHER OPTILITE OR HARDENED GLASS.*

for Every Eye Protection Need!

You'll Like USSSCO's Personalized Service—USSSCO products are sold direct to the user through our own staff of trained, full-time Safety Service Engineers. One of these men is located within a few minutes—or at most a few hours—from you. He can help you select, from the complete USSSCO line, all your safety eyewear requirements. Look in your Phone Book Yellow Pages, or write us in Kansas City.



TWO SAFETY LENS MATERIALS:
Your choice of **OPTILITE®** or Hardened Glass, in either Prescription or Plano, in the popular S-7 interchangeable lens shape.

Light Weight All-Plastic
"HALO®" FACE SHIELD
With green, non-glare spark protector. Patented hinge locks window in "raised" or "working" position.

A Chemical Goggle that Won't Fog
NEW AIRFLOW® SAF-I-CHEM®
Combines splashproof eye protection with amazing ventilation—guaranteed non-fogging except under most extreme conditions. Lightweight, comfortable molded vinyl frame in Chemical Color Code Yellow, or Crystal. Replaceable lens.

Non-Fogging Cover Goggle
NEW AIRFLOW® SAF-I-FLEX®
"Wraparound" stainless steel screen ventilation—no air traps. Comfortable molded vinyl frame fits over widest personal glasses. Clear or green replaceable lens.

Light Weight All-Plastic Safety Spectacle
S-A-F-I-S-P-E-C®
Maximum "spectacle-type" eye protection against impacts, plus smart modern styling. Weighs less than 1 oz. Clear or green replaceable lens.

Low Cost, Comfortable Cover Goggle
THRIFTY SAF-I-FLEX®
All-purpose eye protection against impacts. Fits over all personal glasses. Soft, tough, vinyl frame with generous grid vents. Clear or green replaceable lens.

One-Piece Low-Cost Eye Shield
SAF-I-SHIELD®
Optically correct plastic lens. Three types of ventilation. Choice of clear or green.

ALSO MADE BY USSSCO:
"PEP-UP®" Salt Tablets • SAF-I-CUP GOGGLES for Welders and Chippers • SAF-HED® Protective Hats • "TUFFY®" Vinyl Aprons • SAF-CO-METER® for detecting CO in the air • SAF-I-WELD® Welding Lenses • SAF-I Lens Cleaner and Goggle Cleaning Stations.

All USSSCO Safety Eyewear meets Federal specifications for optical qualities, impact and piercing resistance.

A centralized warehouse located in the Heart of America insures prompt shipment of complete orders from stock, with quick delivery to all points by modern transportation.

UNITED STATES SAFETY SERVICE CO.
BRANCHES IN PRINCIPAL INDUSTRIAL CITIES

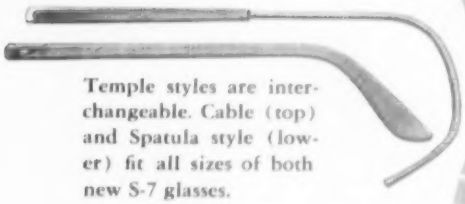
Div. A-3, 1215 McGEE ST., KANSAS CITY 6, MISSOURI
IN CANADA: PARMELEE, LTD., TORONTO & MONTREAL

All items in the USSSCO line are of USSSCO's own design and manufacture. Our facilities are modern and complete—research and testing laboratories — engineering — designing — modern manufacturing plants. These facilities, with USSSCO's nation-wide sales organization and personalized service, offer a unique service covering all your eye safety requirements.

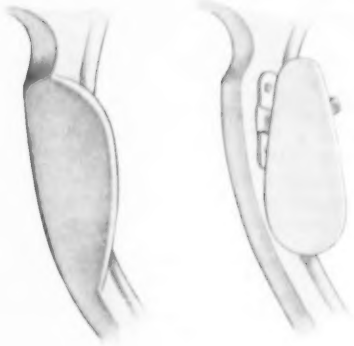
you get so much more

New Redy-Fit attachable side shield is interchangeable; may be fitted to any eye size of B&L S-7 safety glasses. Send for introductory folder A-1518.

This is PROTECTION-PLUS safety eyewear. Both Titan (combination metal-plastic frame, above) and the all-acetate style (below) with Bal-SAFE impact-resistant lenses, provide added protection, good looks and new economy of use. In plano or prescription.



Temple styles are interchangeable. Cable (top) and Spatula style (lower) fit all sizes of both new S-7 glasses.



Choice of solid or adjustable nose pads to suit individual preference.

for your eye safety dollars

New Bausch & Lomb Safety Glasses

deliver PROTECTION–PLUS

New interchangeability of temples and side shields permits new flexibility of use . . . with reduced inventory

See for yourself how Bausch & Lomb PROTECTION-PLUS safety glasses introduce new economies while providing better protection. Phone the Bausch & Lomb supplier in your area. Or write for descriptive literature: Bausch & Lomb Optical Co., 90315 Smith St., Rochester 2, New York.

BAUSCH & LOMB

SINCE 1853

Head Protection

—*From page 101*

Green—Welders
Buff—Rigging
Yellow—Electrical
Black—Labor
Gray—Burning
Brown—Carpenters
Brown bottom, white top—Painters
Red bottom, blue top—Machinists
Gray bottom, white top—Shear and Blacksmith shops
Lavender—Expeditors
Aluminum—General foremen
Brown bottom—yellow top—Caulkers and sanders

A black line on a helmet denotes a foreman and a red line a leaderman. Badge numbers are also stencilled on the front of each helmet.

Headwear for Women

Women are seldom employed in peace time occupations where protective hats are required. Their hair, however, provides a problem around moving machinery. Much effort has been expended in designing headwear that provides adequate protection and is reasonably attractive in appearance.

Scalping is likely to occur at points where hair may come in contact with rotating parts, or where enough static is produced by the machine to lift the hair.

Enclosing the machine may be practicable in some operations but women who work around machinery should wear caps which cover the hair completely. Hair covering is generally desirable from the standpoint of cleanliness.

Hair covering should be made of durable fabric which will withstand repeated laundering. Design should be simple so that pressing may be done by machine. Flame-retardant material should be used if worn near spark or flame.

Caps with peaks provide warning before the head comes in contact with a moving object. They should be provided in a sufficient variety of head sizes or with a sufficient range of adjustment to fit all persons.

Hair nets or turbans, preferred by many women, are not considered sufficient protection around moving machinery. Sometimes their use is a compromise with feminine taste. * * *

References—Head and Respiratory Protection

National Safety Council: Accident Prevention Manual for Industrial Operations, 1955.
—Hard Hats; Data Sheet D-425.

National Safety News: They'll Wear Clean Respirators; Dec. 1950.
—Gas Masks for Peace Time; G. M. Glidden, Jan. 1953.
—Protection Against Contaminated Atmospheres, B. F. Postman, Nov. 1953.
—Investment in Protection; June 1954.
—Volts and Jolts (Head Protection for Electrical Workers); C. P. Shirey, July 1954.

American Standards Assn.: Protection of Heads, Eyes and Respiratory Organs, Safety Code for, Z2-1938 (National Bureau of Standards Handbook H24). Out of print.

Hard Hats Serve As Crash Helmets

On August 22, the Glen Ullin line crew of Montana-Dakota Utilities Company, en route between a work site and New Salem, N. D., was traveling south on a gravel road toward Highway 10.

Suddenly, the truck's steering mechanism failed. The truck left the road and rolled over in a ditch. Four crew members were in the truck, two in the riding compartment and one seated beside the driver.

Because all the men were wearing hard hats at the time of the accident, possible serious head injuries were prevented. Deep gouges were found in the cap worn by driver-foreman Warren McNamar. Abrasions and a two-in.-long crack, extending from the lower brim up toward the crown in the center of the back, were found on crew member Pat Sullivan's cap.

Quotes from an August 24 letter by H. E. Mangskau, superintendent of electric transmission, present a graphic report of the accident:

"The steering mechanism on the line truck came apart in the linkage ahead of the tie rod, and the front wheels jack-knifed, throwing the truck into the right ditch. The truck struck the opposite shoulder of the ditch, rolled over, and returned to an upright position. The line crew members were shaken up and received some cuts, bruises and abrasions, although none was seriously injured.

"They were taken to Bismarck for checkup and medical treatment, and were released to return home . . . All of the men were wearing their hard hats at the time the accident occurred and it is quite evident that these hats protected them from serious head injury. Two of the hard hats were badly gouged and split.

"The line truck was badly demolished in that the front wheels were wiped out from under the car as it struck the ditch embankment. We know that the steering mechanism failed because a part of the linkage equipment was found in the road behind the location where the truck jack-knifed into the ditch.

"The truck was being driven by Mr. McNamar, line crew foreman, and was proceeding at about 25-30 miles per hour along a good graveled road . . . The crew members were all at work on Thursday (the next day) and it appears that none suffered serious injury.

"My husband who *fancies* himself a handy man . . ."

Musketeer
+ *new*

FIBER VISOR with WELDING LENS

For use in scarfing and furnace work, heavy gas welding and cutting, this vulcanized fiber shield, 6⅛″ deep, holds filter lens of desired shade and cover glass in insulative lens holder of high-impact resistant thermosetting plastic.

Musketeer
+ *new*

METAL-BOUND PLASTIC VISORS

The full line of visors as made for the long popular type J-1 Eye and Face Shield are now available with the Musketeer Headgear. Much improved with a sturdy metal binding, they hold their desired shape. Made 11⅛″ wide, in depths of 4, 6, and 8 inches (shown) in clear Plastacele .020″, .030″ and .040″ thick, and in light, medium, and dark green Plastacele in .020″ thickness only.

new JACKSON QUALITY PRODUCTS *one for all*

Musketeer

A Durable, Comfortable and Convenient Headgear Assembly with a Choice of Four Eye and Face Shields

Sucessfully used before on JACKSON'S arc welding helmets, the *Adjust-O-Lok* headgear, with its exclusive friction pivots, combines with a new, wide *Spark Deflector* to carry a choice of interchangeable eyeshield visors snapped to its front.

Headband and cross strap, both adjustable to size, are molded in one piece of lightweight, nonconductive Nylon. Headband adjustment is made by a large, easy to handle winged knob and gear, also of Nylon, while wearing the shield; enclosed mechanism is smooth against the head. A cork-padded sweatband is optional at extra cost.

The Nylon friction pivots are also adjustable while the shield is worn, locking it in any position or allowing free up and down movement.

Jackson Products

AIR REDUCTION SALES CO., A DIVISION OF AIR REDUCTION CO., INC.

WARREN • MICHIGAN

ARC WELDING ACCESSORIES AND SAFETY EQUIPMENT

Musketeer + *new*

KING-SIZE ALL-PLASTIC VISORS

Designed for greater protection in both width and depth, 15½″ wide by 9″ deep, they are made in clear Plastacele .020″ and .040″ thick, and in light, medium, and dark green .020″ thick only. (Interchangeable with type F-1 Face Shield visors, used with the Jackson Safety Hat.)

Musketeer
+ *new*

WIRE SCREEN VISOR

For use in furnace work and drop forging, this galvanized steel, 24-mesh visor, 15½″ wide by 9″ deep, catches molten metal, disperses heat.

THE SAFETY LIBRARY

Books, pamphlets and periodicals of interest to safety men

Compiled by Ruth Parks, Librarian, NSC

Chemical Dictionary

The Condensed Chemical Dictionary, Fifth Edition. Revised and enlarged by Arthur and Elizabeth Rose. Published by Reinhold Publishing Corp., New York, 1956. 1220 pages, $12.50.

THIS IS THE fifth edition of a text which has been a standard for quick reference for more years than I have been working in the profession. It is about one and one-half times the size of the fourth edition published in 1950.

It now claims to contain 30,000 entries and, by observation, a very large number of them are trade names referenced by the name of the manufacturer which has turned out to be an extremely convenient service.

Physically it is a pleasing book, well bound and printed on a good grade of white offset paper that reads easily and apparently will last well under continuous desk reference.

F. A. VAN ATTA

Preventing and Fighting Chemical Fires

Fire Protection for Chemicals. By Charles W. Bahme. Published by the National Fire Protection Assn., International, 60 Battery March St., Boston 10. 1956, 147 pages, $3.00.

THE MATERIAL in this book has appeared previously as a serial in the *Quarterly of the National Fire Protection Association* study in 1952. If there were errors in the material it is probable that at least most of them have been detected and corrected.

In spite of the fact that it is essentially a one-man job (and it is astonishing that one man could collect pertinent information on so many individual materials without falling into grievous errors), the book seems to be remarkably accurate throughout, at least in the areas familiar to this reviewer.

The amount of material supplied on any given compound is obviously small since several hundred compounds are considered in the 147 pages and they are necessarily two or three to a page. The principles as to fire hazard, toxic hazard and methods of fire fighting are, however, quite well outlined, and here, certainly, is a stock of information which has not been gathered together between one set of covers in any other place.

The stated purposes are for the training of fire protection engineering students and fire fighters and as a quick reference for people concerned with fire protection and fire fighting. For these purposes it should be well worth its price to anyone.

The specialist in any one compound or group of compounds will naturally want something more comprehensive in his own specialty. It still is true and will be for the foreseeable future that the best protection from chemical hazards is a chemist familiar enough with the materials and their reactions to foresee all of the hazards.

F. A. VAN ATTA

Industrial Waste Disposal

Biological Treatment of Sewage and Industrial Wastes, Volume I—Aerobic Oxidation. Edited by Brother Joseph McCabe, FSC and W. W. Eckenfelder, Jr. Published by the Reinhold Publishing Corp., New York, 1956, VII plus 393 pages, $10.00.

THIS BOOK presents the 33 papers given at the Manhattan College Conference on biological treatment of wastes held in April of 1955.

The first two sections, comprising almost two-thirds of the text, are concerned with the theory and mechanism of the biological treatment of waste and with the theory of oxygen transfer into the biological treatment system and design of equipment for introducing oxygen to the process.

The third section is concerned with practical design and operation of activated sludge plants for the treatment of domestic sewage and the fourth section of 32 pages on the design and operation of activated sludge plants for the treatment of selected industrial wastes. The wastes considered in this section are those from pulp and paper plant, dairy, waste waters and waste waters from a cannery handling fruits and vegetables.

Each of the papers is the product of a specialist in his field and each of the sections contains a fairly extensive set of references so that the whole result is a very comprehensive text on both the theoretical and the practical aspects of aerobic waste treatment.

With the present urgency for proper disposal of a wide variety of industrial wastes it should be a very popular reference. It might be even more popular because most of the authors seem to have started with the assumption that their audience would not be accomplished mathematicians and the mathematical treatments, even in the theoretical sections, are generally reduced to the necessary minimum.

F. A. VAN ATTA

BOOKS AND PAMPHLETS

Blasting

Field-Compounded Blasting Agents. Association of Casualty and Surety Companies, 60 John St., New York 38. 1957. 5p. Special Hazards Bulletin, Jan. 1957-2-100.

Chemicals

Ethyl Ether. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956. 18p. Chemical Safety Data Sheet SD-29 (revised). 30c.

Mixed Acids. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956. 15p. Chemical Safety Data Sheet SD-65. 30c.

Phthalic Anhydride(Commercial). Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956. 15p. Chemical Safety Data Sheet SD-61. 30c.

Trichloroethylene. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956. 15p. Chemical Safety Data Sheet SD-14 (revised). 30c.

Fire Protection

Occupancy Fire Record—Bowling Alleys. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1956. 8p. Fire Record Bulletin FR 56-7. 50c.

Occupancy Fire Record — Laundries and Dry Cleaning Plants. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1956. 12p. Fire Record Bulletin FR-56-8. 50c.

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For nuisance dusts and fumes. Weighs only 4 oz.

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Wear a Genuine

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Chemical cartridges. For organic and inorganic gases.

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Gas-tight, fog-proof. Wear with any respirator.

$2.00

High Pressure Carbon Dioxide Fire Extinguishing Systems. Fire Equipment Manufacturers' Association, One Gateway Center, Pittsburgh 22, Pa. 1956. 6p. 25c.

Gases

Hydrogen. U. S. Atomic Energy Commission, 1956. 10p. Safety and Fire Protection Technical Bulletin No. 5. Superintendent of Documents, Washington 25, D. C. 15c.

Grinding

The Use, Care and Protection of Abrasive Wheels. American Standard Safety Code. American Standards Association, 70 E. 45th St., New York 17. 1956. 74p. ASA-B7.1-1956 (revision).

Hospitals

Safe Practices for Hospital Operating Rooms. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1956. 48 p. NFPA-No. 56. 25c.

Marine Industry

Protecting Tanker Crews from Accidents. 1956. 8p. Marine Safe Practices Pamphlet No. 108. Pacific Maritime Association, 16 California St., San Francisco 11.

Mines

Methane Buildup During Cutting and Continuous Mining Operations. U. S. Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. 1956. 22p. Report of Investigation 5288. Free.

MAGAZINE ARTICLES

Air Pollution

"Present Status of Atmospheric Pollution in the United States." Arthur C. Stern. *American Journal of Public Health* Jan. 1957. P. 78-87.

Dust

"Dust Explosions." *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 216-244.

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"Brooklyn Pier Fire and Explosion." Chester I. Babcock. *Firemen.* Jan. 1957. P. 10-11.

"Employee Education Essential." *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 159-163.

"Fire Prevention, Fire Fighting: How to Teach it in the Pulp and Paper Industry." M. M. Batzer. *Pulp and Paper Magazine of Canada.* Dec. 1956. P. 131-133.

"Fire-Resistant Hydraulic Fluids Can Save $1 Million/year." Charles Emerson. *American Machinist.* Dec. 31, 1956. P. 82-86.

"Heavy Timber Construction." Frank J. Hanrahan. *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 205-211.

"Roof Venting for Fire Safety." E. J. Sestak. *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 212-215.

"State Interests in Explosives Transportation." Carroll E. Shaw. *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 172-175.

"Testing for Fire Safety." A. J. Steiner. *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 195-204.

Flammable Liquids

"Flammable Liquids from Container to Process." Stanley F. Spence. *Quarterly of the National Fire Protection Association.* Jan. 1957. P. 176-194.

Health

"Clinical Study of Pneumoconiosis of Coal Workers in Ohio River Valley." Milton D. Levine and Murray B. Hunter. *Journal of the American Medical Association.* Jan. 5, 1957. P. 1-9.

"Emerging Industrial Health Problems." Henry N. Doyle. *Industrial Medicine and Surgery.* Jan. 1957. P. 1-5.

Hydraulic Fluids

"Researching New Hydraulic Fluids." S. P. Polack. *Coal Age.* Jan. 1957. P. 82-84.

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"Protective Clothing for Woods Workers." D. B. Chant. *Pulp and Paper Magazine of Canada.* Dec. 1956. P. 143-144.

Management

"Management and Safety." C. W. Smith. *Pulp and Paper Magazine of Canada.* Dec. 1956. P. 190+.

Mines

"Radon and Radon Daughter Hazards in Mine Atmosphere." Richard D. Coleman and others. *Industrial Hygiene Quarterly.* Dec. 1956. P. 405-410.

Noise

"Evaluating Noise Problems." Charles R. Williams. *Best Insurance News, Fire and Casualty.* Dec. 1956. P. 69-71+.

"Revised Criteria for Noise in Buildings." Les L. Beranek. *Noise Control.* Jan. 1957. P. 19-34.

Radiation

"A Low Dose Range Chemical, Radiation Detection for Personnel Monitoring." Sanford C. Sigoloff. *Industrial Hygiene Quarterly.* Dec. 1956. P. 426-428.

"The Management of Power Reactor Wastes." G. Hoyt Whipple. *Industrial Hygiene Quarterly.* Dec. 1956. P. 421-425.

"Open Field Burning of Low Level Radioactive Contaminated Combustible Waste." W. B. Harris and M. S. Weinstein. *Industrial Hygiene Quarterly.* Dec. 1956. P. 388-390.

"Pulmonary Radiation Effects as a Function of Absorbed Energy Distribution." H. Cember and others. *Industrial Hygiene Quarterly.* Dec. 1956. P. 397-400.

Workmen's Compensation

"Doctor and Workmen's Compensation." Forrest E. Rieke. *Industrial Medicine and Surgery.* Jan. 1957. P. 9-22.

DIRECTORY AVAILABLE

The semi-annual cumulative index to NATIONAL SAFETY NEWS for the last half of 1956 is available free from the National Safety Council Library.

ADDRESSES OF MAGAZINES MENTIONED

American Journal of Public Health, American Public Health Association, 1790 Broadway, New York 19.

American Machinist, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36.

Best's Insurance News—Fire and Casualty, 75 Fulton St., New York 38.

Coal Age, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36.

Firemen, National Fire Protection Association, 60 Batterymarch St., Boston 10.

Industrial Hygiene Quarterly, American Industrial Hygiene Association, 605 N. Michigan Ave., Chicago 11.

Industrial Medicine and Surgery, 605 N. Michigan Ave., Chicago 11.

Journal of the American Medical Association, 535 N. Dearborn St., Chicago 10.

Noise Control, Acoustical Society of America, Prince and Lemon Sts., Lancaster, Pa.

Pulp and Paper Magazine of Canada, Gardenvale, Que., Canada.

Quarterly of the National Fire Protection Association, 60 Batterymarch St., Boston 10.

The reason a lot of people do not recognize an opportunity when they meet it is that it usually goes around wearing overalls and looking like hard work.

LOOK TO WILLSON

For Eye Protection

Typical of Willson leadership in eye protection are the exclusive hinged-bridge Contour-Spec®, the stylish tortoise frame WF Spectacle, the big, roomy, light-weight Kover-Mor Goggle®, the light-weight, plastic Mono-Goggle®, the new all-plastic Feather Spec® and 40 other styles of comfortable eye protective equipment for all hazardous occupations including welding.

For Respiratory Protection

The new, all-rubber face piece of the Willson Monomask provides the comfort and efficient protection for which Willson is famous. It takes its place in the complete Willson line of respiratory equipment with such leaders as the Style 800 Interchangeable Respirator, Style WUG Gas Mask and Style GA Airline Respirator.

For Head Protection

Willson Super-Tough safety hats and caps offer the user a choice of every type of plastic head protection available today—and in a choice of 5 colors. The super-strong Phenolic hats and caps provide maximum protection; the light-weight Fiberglas hat provides adequate protection with maximum comfort; and the molded, all-plastic Electrical hat provides the protection so essential to electrical workers.

AND for SERVICE

The Willson network of distributors is at your service to give you expert advice and prompt delivery of Willson equipment to meet your personnel protection needs. Get to know your Willson Distributor better—call him—or, if you don't know him, write us and we'll give you his name, address and phone number.

Over 300 Safety products carry this world-famous trademark

Leaders in Research of Safety Equipment Since 1870

WILLSON PRODUCTS DIVISION

RAY-O-VAC COMPANY

205 Washington St., Reading, Pa.

Eye Conservation

—From page 98

goggles and spectacles become smudged and facilities for cleaning them on the job are desirable. Convenient cleaning stations encourage frequent cleaning. These may dispense silicone-treated tissues or cleaning liquid and soft tissues. The latter should be used for plastic lenses. * * *

What is "Good Vision?"

Ability to read charts on a wall does not necessarily mean that a person's vision will be adequate for the job to which he may be assigned. Tests should cover these visual requirements:

Near acuity. Ability to focus and see well with both eyes separately at a distance of 15 in. This

VISUAL SURVEYS may be made with one of three types of instruments on the market. Tests show individual's fitness for various jobs and whether correction for visual defects is needed.

is the distance at which most machine and office work is done.

Distance acuity. Ability to focus eyes of a distance of 20 ft. or more. This is necessary for crane operators, jeep and truck drivers, railroading, for example.

Adequate field of vision. Ability to see to both sides, and up and down, while focusing on a small target.

Depth perception. Ability to judge space relationship. This is important for accuracy in almost any job. * * *

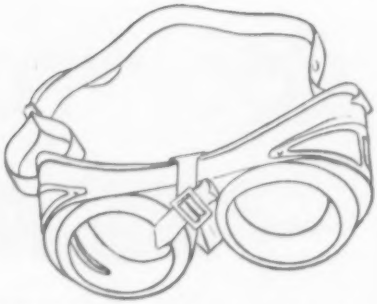
Safety Glass Frames Can Be Stylized

GENERAL ELECTRIC, Cleveland, has come up with a plan to increase the "esthetic value" of safety glasses.

Dye them to satisfy the style-conscious person, suggest H. V. Hodnick, safety engineer, and W. Kenerson. Their method consists of dyeing the plastic frames of safety glasses with an inexpensive dye, available in a variety of colors at variety stores.

Directions for dyeing: (1) Dissolve the dye in hot water (water temperature is critical, since overly hot water may distort the frames); (2) Immerse the glasses intact in the dye for about 10 minutes (varying immersion time will produce different shades), and (3) remove the frames, wipe off excess moisture, and dry.

Result is an attractive, color-styled pair of safety glasses.



CUP-TYPE goggles are designed to protect the eyes for the more severe exposures.

Devices for Eye, Head and Respiratory Protection
National Bureau of Standards Handbook H24

Protector. A device placed in front of or over the eyes, face or head to afford protection from the hazards in industrial processes or from the natural elements.

Goggles. An optical device worn in front of the eyes, whose predominant function is protection to the eyes only.

Face Mask. A device worn before the eyes and a portion or all of the face, whose predominant function is protection to the eyes and face.

Helmet. A rigid device worn by the operator which shields the eyes, face and neck, and a portion or all of the other parts of the head and is held in place by suitable means.

Hood. A non-rigid device which completely covers the head, neck and portions of the shoulders so as to exclude dust and flying particles.

Shield. A device held in the hand, or supported without the aid of the operator, whose function is protection to the eyes and face.

Gas Mask. A device worn on the face, and so arranged that the inhaled air is drawn entirely through a canister which cleans it chemically.

Supplied-Air Respirator. A device designed to supply the wearer with air suitable to breathe while surrounded by a contaminated atmosphere, and to prevent the latter from being inhaled.

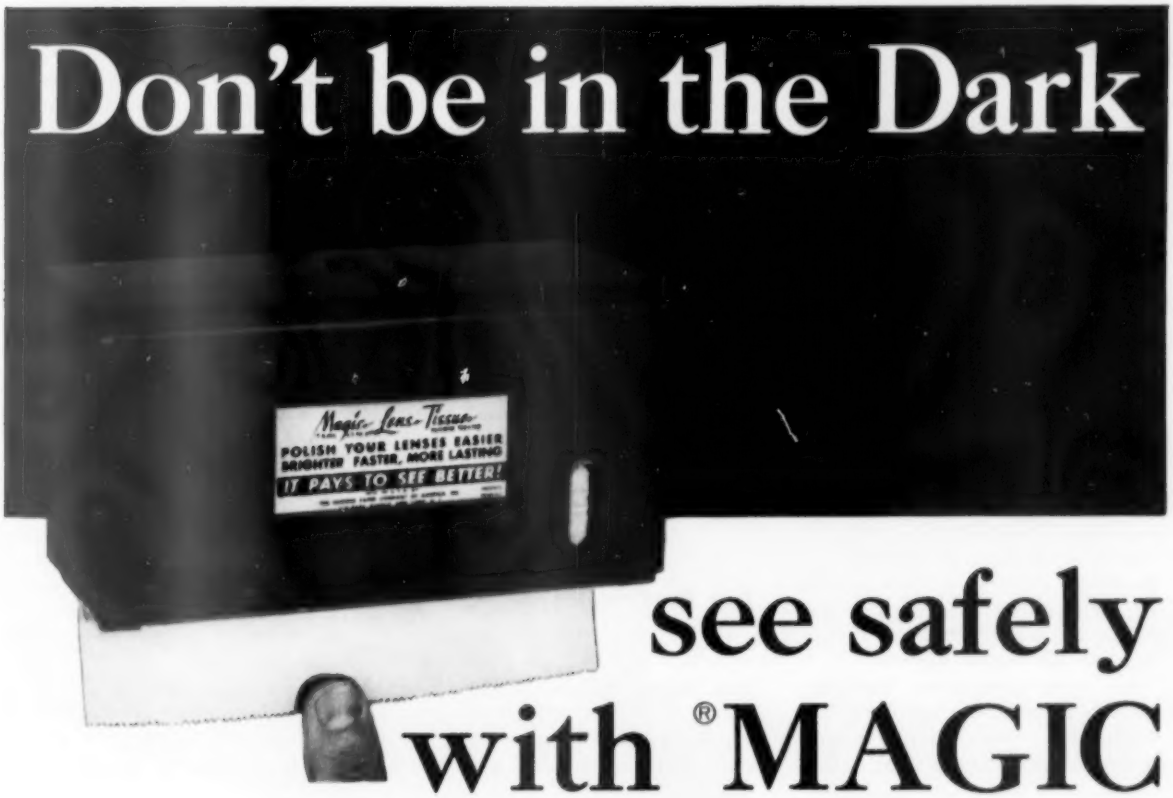
Hose Mask. A supplied-air respirator having a tight-fitting facepiece to which is attached a hose through which air may be forced by a blower, and through which the wearer can inhale whether the blower is operating or not.

Air-Line Respirator. An air-line respirator is a supplied-air respirator designed to be connected by a hose to a supply of fresh air under positive pressure sufficient to maintain a continuous flow into the facepiece.

Filter Respirator. A device designed for the wearer to inhale the surrounding atmosphere after it has passed through a filtering medium to remove the impurities. The filtering medium may chemically absorb or mechanically obstruct the impurities.

Cartridge-Type Respirator. A filter respirator whose filtering equipment is carried in one or more cartridges mounted on the facepiece. Such a respirator may be a mechanical filter respirator, a chemical filter respirator, or a combination of both.

Don't be in the Dark



see safely with ®MAGIC

Ten times as many accidents arise from lack of proper vision as from injuries to the eye. Eye injuries are now 2% of the safety problem. Foul sight constitutes 25%. Safety eyewear must be cleaned with something. That something should be MAGIC SILICONE LENS TISSUE. It is the only first-class sheet of Silicone-treated tissue made in the United States; a marvel of the papermakers art; the finest quality to be found in the world. Each sheet is over 50% larger than usual, and has twice the tearing strength. Yet because of our volume our tissue costs you less. Deposits a protective film of sparkling Silicone on the lenses. Polishes and protects as it cleans instantly. Compact steel Dispenser has no bothersome lever to break or any moving parts. Self-mounting—just stick it to the wall. Tissue (6 refills) $8.40 per carton; Dispenser $2.50 each, or free when exchanged for any other cleaning stations.

MAGIC Pop-Up Pack in self dispensing box for your desk or any place in the office, plant or laboratory, $11.95 per carton of twelve Boxes.

MAGIC HEAVY-DUTY cleaning station for grimy, oily, areas where washing with a fluid is unavoidable, or where Anti-Fogging treatment is required, use on plastics or any eyewear. MAGIC Cleaning and Anti-Fogging Fluid is combined in one can, *pressure-packed*. Touch the top and Presto! the can does the rest. 12 12-oz. cans per carton $12.50. About 1400 applications per can. Or, if you wish to use your own home made fluid, we can supply our adapter ($2.70) with a giant 16 oz. bottle and plunger complete. The Heavy-Duty Paper is our superb, super-strong, wet-strength sheet. Naturally, no scratching on plastic, and no lint, 18 big 760-sheet refills per carton at only $11.60. Indestructible steel Dispenser ($5.95) releases these interfolded sheets one-by-one, not in bunches, greatly reducing waste. Go Modern, Buy MAGIC. All prices F.O.B. shipping point. Order Now! Exchange all your other stations for Magic FREE. Wire or write us or your safety jobber today.

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Cleaning Stations

THE SILICONE PAPER CO. OF AMERICA, INC.
75 East 45th St., New York 17, N. Y.
SERVING EVERY MAJOR INDUSTRY IN AMERICA

The Safety Engineer

—*From page 4*

units advising that no change will be made in standards established for equipment under test. After careful study by the safety department, it is possible to reduce amount of inventory required, and it also is possible to plan and order more effectively with less obsolescence of equipment.

In any company, safety is everybody's responsibility, especially the foreman's. When establishing standards for equipment, we have found by experience that if the engineering department, foremen and workers are consulted and given responsibility in selection of equipment, acceptance will be more satisfactory. This method of establishing standards also raises the safety engineer's position in associates' eyes.

In most companies, the purchasing department, not the safety engineer, orders safety equipment. In our company the safety department, in cooperation with department heads and foremen, initiates all safety equipment orders, which in turn are released to the purchasing department for procurement.

Requisitions include brand names, catalog numbers and quantities desired. Safety equipment is not placed for bid, since safety equipment is purchased for its quality and protective values rather than for low cost.

It can be seen that we are not usurping any of the purchasing department's responsibility. We are trying to help it help us do a better job by giving it proper information so it can buy the best protection available.

The Purchasing Agent

—*From page 5*

tion. Before bids are requested or orders written, the purchasing man frequently can spot faulty or incomplete specifications.

Fourth responsibility: *Selection of responsible and qualified suppliers.* For this the purchasing man should be eminently qualified. Both his title and job responsibility are tied into the task. It's his specialty.

Writing the Order

Fifth: *Preparation of a proper purchase order.* The purchase order must not only describe the material carefully; it must also show what standards it must meet. If specifications are at variance with the standard, the purchase order should show these exceptions. The purchase order cannot be considered complete unless it refers to all warranties the supplier is expected to provide. It should contain a forthright statement as to time required to inspect the product before payment.

When equipment is involved, the purchase order should include a statement that parts or assemblies must conform to provisions

Low cost hairgards add fashion to safety

Fashion designed StaSafe Hairgards, in a wide variety of flattering colors, are tailored to today's women. Modern styling of mesh Hairgards match good looks with safety. Solid cap styles are popular for protection against dust, oil mist and possible scalp infection. Snood models, in either mesh or solid material, are designed for long hair styles.

Hairgards are also available with your slogan or emblem printed in one contrasting color. Helps make your safety program a morale builder. Strengthens pride in department, work, company and safety record.

Hairgards bring stylish fashion along with better safety into your plant.

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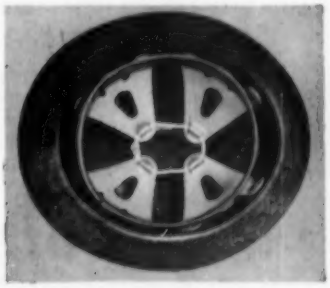
- ONE SIZE FITS ALL HEAD SIZES
- Easily sterilized
- S-section beaded edge... never any distortion
- No lacing. Low cost, quick replacement of sweatband only. Never need to replace entire suspension
- Fully tested and approved *(exceeds all government test specifications for impact, penetration, electrical resistance, flammability and water absorption)*

7 COLORS: White, Gray, Red, Yellow, Green, Blue, Brown. Other colors available on special order. Colors are molded-in... permanent... abrasion-proof!

Write for Bulletin No. 45

SuperGard
GIVES FULL PROTECTION

Shells for *SuperGard* Hats and Caps are made of Fiberglas-reinforced, superior polyester resin. They are strong, light in weight, and are impervious to moisture. They meet Federal specification tests for impact, penetration, electrical resistance, flammability and water absorption... and are fully resilient for life of the SuperGard. Tough, handsome, durable and—most important—*extremely comfortable, SuperGards* are the kind of safety equipment men *enjoy* wearing. Check ALL their features for *good reasons.*



REAL WEARING COMFORT. Suspension is form-fitting resilient material that shapes to wearer's head ...quickly and ideally comfortable. Easily adjusts for depth...for "air conditioned" separation from shell. Easily removed and replaced. No metal parts!

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THE WORLD'S LARGEST MANUFACTURER OF SUPERIOR PROTECTIVE EQUIPMENT

WELDING HELMETS • SPEEDY ATTACHMENT • INSULATED EUREKA HOLDER • FACE SHIELDS • WELD CLEANING HAMMERS • FRESHAIR SYSTEMS

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of law pertaining to the type equipment ordered. Packing instructions should state clearly the safest means of handling the material.

Sixth: *Price shall be subordinate to safety.* Price usually reflects labor and raw materials costs. Addition of safety features usually adds to price, but it does not always mean extra cost.

Purchasing men are learning that price is not the criteria; therefore, the purchasing agent's total responsibility for price rests with costs. These costs include not only price of the material, but subsequent costs of deterioration, obsolescence and handling. Unsafe features and substandard quality add to a product's cost.

The purchasing agent will be interested in establishing minimum requirements for safe handling, safe storage and safe use of any item he buys.

A buyer can do many things to increase safety of handling material. He can, for example:

1. Cut down on the package weights of materials to permit one-man handling in the warehouse.
2. Assist in the design of shapes and types of packages which can be handled with less chance of accident or injury.
3. Insist on adequate markings to show the handler what particular care should be taken.
4. Make certain that the safety engineer and machine operator have complete instruction on operation of machines.

A typical example of a change which increased safety was a recommendation made recently to a supplier of pipes and fittings. Instead of wiring the pipes and fittings together and shipping them loose, the buyer insisted they be placed in a bag or be wrapped as a bundle to permit rapid handling without risk of injury. How the supplier packages and marks materials he sells is the unquestionable responsibility of the buyer.

All six points can be summarized by saying that the buyer's responsibilities do not change with inauguration of a safety program. Responsibilities have always existed. He must now do a little more of everything he did before to make the program workable. New ways to get hurt are being discovered faster than safety engineers can correct causative conditions.

Experience also has taught that there still is some distance to go before we will be taking full advantage of the combined accident-prevention potential of the safety engineer and the purchasing agent. As long as more than a million and a half persons annually have accidents in industry, we will continue to encourage closer cooperation by those in industry best qualified to do something about preventing accidents. With the help of the purchasing agent, the safety engineer can go a long way in avoiding purchase of injuries as a part of purchase of materials.

Most of us don't put our best foot forward until we get the other one in hot water.

WIDE SCOPE VISION
POSITIVE EYE PROTECTION

New WELSH, square shape lens in smart, modern frames increases visual efficiency, safety and comfort

SERIES 2800 — Combination Metal and Plastic Frame Safety Spectacles: Sturdy, lightweight, cordovan colored, plastic upper frame blends attractively with metal bridge and metal eye wires. Designed for more attractive appearance while assuring eye safety.

SERIES 2400 — Plastic Frame Safety Spectacles: Extra rugged but extremely light butyrate frame is available in copper, cordovan or crystal pink color. Available with plastic side shields and comfort cable or spatula temples.

SERIES 3700 — Metal Frame Safety Spectacles: Ribbed design on frame adds to attractiveness. Frame has full swing temple. Brace bar at bridge construction provides high rigidity. Solid shanks of rocker arm nose pad give maximum shock resistance. Available with plastic shields for better ventilation, vision and comfort.

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See Booths 20 & 21
27th Annual Safety Exposition
March 18th — 22nd
Hotel Statler
New York, N. Y.

Ventilation

—*From page 76*

ess requires a practically dust-free atmosphere.

A combination of viscous filter and electrostatic precipitation with a self-cleaning feature is used on some models. It solves the problem of dust capacity and of heavy particles.

Cyclones. A cyclone consists of an outer cylinder fitted with an inverted cone-shaped hopper and an inner concentric cylinder which serves as a discharge duct. Air from the main duct of the exhaust system, under high velocity, enters the large chamber where the air is given a circular motion. The heavier particles are thrown to the outer wall by centrifugal force and fall along the wall. Air escapes through the top.

Cyclones are the most effective for large particles, such as sawdust, shavings, heavy lint, etc. After passing through them, air cannot be returned to the workroom without further filtering. Cyclones are relatively inefficient for removing small particles.

Multiple small diameter cyclones of small taper collect finer particles than the common large diameter ones, mostly because of higher velocities and greater centrifugal force.

Dynamic separators combine fan and collector in one unit. This type of separator is somewhat like a cyclone, but the centrifugal separating action is performed by the revolving blades. It is more efficient than the cyclone.

In some types water spray is introduced with the dust at the inlet. Wet collection increases efficiency for fine dusts.

Wet collectors use several devices for obtaining contact of water with the exhausted air so that dust particles form a sludge. One type consists of sprays or water curtains through which dust-laden air is drawn. These are efficient collectors for many types of dust.

An important application is in the prevention of dust explosions from grinding aluminum or magnesium.

Supersonic flocculation. Suspended dust is passed through a field of supersonic vibrations, inaudible to the human ear, generated by a high-frequency siren. Vibration flocculates the fine particles, and the aggregates are then collected by cyclones or other measures for collecting relatively coarse particles.

General Measures

Personal protective equipment is needed where exposure is occasional or where complete protection is not practicable. Removal of the hazard at its source should remain the objective.

Sanitation and housekeeping must receive constant attention. Otherwise equipment will lose its effectiveness and unhygienic conditions develop.

Supervision and training of employees, particularly in hazardous operations, are important.

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Glendale Industrial Safety Equipment
TYPE 90—CLEAR
TYPE 91—GREEN
PLANT VISITORS' SPECTACLES
(Featherweight One-Piece Construction)
Specially designed and priced as plant visitors' goggles . . . fit all faces, men and women alike. Lenses are optically perfect and molded to .060 thickness. They are impact resistant and afford adequate safety protection for light grinding, spot welding and other semi-hazardous operations. Attractive styling and special lightweight construction make this the goggle that everyone wants to wear. May be worn comfortably over prescription glasses.
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NO-FOG® LENS CLEANING TISSUES are double duty . . . fog-proof and clean in one operation . . . with plain water. No expensive chemicals to buy or stock. For glasses, goggles, face shields, gas masks . . . either glass or plastic. Non-abrasive and harmless to the skin.
These new tissues are economical, ample sized (4½" x 10¾") and may be re-used several times. Send for samples and literature or contact your Safety jobber.
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Available in light or heavy duty stations.
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FOR DUST

STASAFE AIRBORNE HOOD

Here's the new, low cost, clear plastic hood that "rides on air". There's no headgear, no cradle, no adjustments to head size, no limitation on head movement. Air from an external source inflates the Airborne Hood. The wearer works, moves and breathes just as if there were no hood at all—yet he is safe. Exhaust valve prevents ambient air from entering hood.

Huge, clear window permits wide angle vision. Handy drawstring pulls hood close to neck for snug fit. Ample bib may be tucked in coverall.

Price is so very low, hood may be discarded when dirty and you will still be dollars ahead.

NEWEST DEVELOPMENTS IN PROTECTIVE HOODS

FOR LIQUIDS

STASAFE SELF-VENTILATING HOOD

This is the hood, made of highly chemical resistant Gra-Lite, that keeps out hazardous liquids yet permits effortless breathing without a self-contained or external air supply. The secret is in the exclusive "breather-tunnel"—the inverted "V" shaped air passage you see just below the clear plastic window. Ambient air passes through the "breather-tunnel", into the hood. Breathing is easy and normal as dangerous liquids run harmlessly over the tunnel. Unique design also keeps window fog-free and inside of hood cool and comfortable.

Recommended only where ambient air is safe to breathe.

Write today for more information on the StaSafe Airborne Hood and/or the StaSafe Self-Ventilating Hood.

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Medical control is an important check on other methods. Maintenance of engineering control is sometimes inadequate and symptoms of absorption of toxic materials by a worker may be the first real warning.

The safety department should be notified of the introduction of new materials and processes so that possible hazards may be assessed and safeguards provided.

Workers exposed to toxic substances should receive frequent physical examinations. * * *

Washrooms and Lockers

—From page 57

nections mean additional economies in installation and maintenance.

Economy of water is another advantage. Several persons washing at a circular fountain use little more water than one at an individual basin. Each user washes in clean running water of regulated temperature. A foot or hand-controlled mechanism regulates the flow.

Semi-circular units 36 or 54 in. wide mounted against a wall are used for narrow or irregular washrooms.

Precast stone and marble are the most frequently used materials. Some models are also available in enameled iron and stainless steel.

Individual basins of vitreous china or enameled iron make an attractive installation where comparatively small groups are to be accommodated.

Mixing faucets are better than separate faucets for hot and cold water. Hot and cold handles should be plainly marked, with the hot water valve always on the left side. Thermostatic control of water temperature is a desirable safeguard.

Avoid stoppers. Faucets should permit washing in running water.

Enameled troughs may be used where first cost is a consideration. Over these are hot and cold water pipes with mixing faucets spaced not less than 24 in. apart. Double-width troughs, or single-width troughs back to back, save space.

Spray heads at basins or troughs should be high enough to permit washing head, arms and shoulders under the spray.

Showers are needed in many industries, particularly where operations are hot or dirty, or where toxic materials are used. Requirements depend upon nature of the processes. They range from 1 shower for every 5 men to 1 for every 15.

Shower installations may be of the compartment or the circular multi-stall type.

Floors and approaches should be of slip-resistant material, such as concrete with an abrasive surface. A curb 4 in. high should be erected around shower stalls, to keep water within the enclosure. With adequate slope to the drain a curb may not be necessary.

Painting the curb a contrasting color helps to prevent tripping.

Emergency showers. Quick-acting showers should be installed at convenient locations where caustics, acids and other corrosives are handled.

Workers Prefer Fendall Face and Eye Protection

They Like The Perfect Fit, Greater Wearing Comfort, Added Safety

New Contour-Design

SPECTACLE-TYPE GOGGLES

Highly styled to give the appearance of personal glasses, yet ruggedly constructed for complete safety. New shaped lenses conform to the eye area for greater protection. New full floating rocking nose pads, new skull temples give added comfort. New stronger temple joint. Frames of metal or acetate, in a complete range of lens and bridge sizes. Skull or cable temples available on all frames. Side shields in wire screen, clear or green acetate.

CUP-TYPE GOGGLES

Regular cup-type and coverall models to fit over glasses. A complete variety of styles for chipping, grinding, welding, dust and splash hazard jobs. Designed for maximum eye safety and comfort. Adjustable ball chain nose bridge. Perfect fitting, individually molded left and right eye cups. Free turning lens ring for easy changing. Wide range of lens types available; precision ground and hardened for optical perfection.

ADJUSTABLE FACE SHIELDS

Finest face protection for spot, flash and butt welding, sawing, chemical work, buffing, light grinding, etc. Comfortable headgear design . . . no "breaking-in." Tough fibre parts are cut on radius to form oval-shaped (not round) natural contours. Adjustment for head size is easily made and stays put, no slipping. "Snap-on" replaceable windows, available in clear or green plastic, or wire screen, in a wide range of sizes and thicknesses.

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safety glasses clean and safe

A *wide awake* eye safety program requires *more* than safety glasses . . . it also calls for a *really convenient* way to *clean* them and thus assure their proper use. *That's the SIGHT SAVERS way* . . . most practical and efficient method ever developed to keep glasses sparkling clean. Chances are many of the people in your plant are already sold on SIGHT SAVERS . . . they're bought and used regularly by millions of glasses wearers.

SIGHT SAVERS contain enough of silicones to do their job quickly, conveniently, economically . . . no messy fluids. That's why they're ideal in plants . . . just snap the lever on a SIGHT SAVERS CLEANING STATION and it delivers one large 3 x 7" tissue . . . *ready-to-use.*

SIGHT SAVERS CLEANING STATIONS ARE FREE . . . a $2.50 value with your purchase of Sight Savers tissues. So, install plenty of them . . . at convenient points throughout your plant, offices and wash rooms. Available in safety green, black or white. They're compact, 3½ x 8" over-all . . . easy-to-install, adhesive or mechanical mounting . . . easy-to-maintain, simply insert SIGHT SAVERS Refill Packets, 800 tissues each, as needed.

Give the green light to greater eye safety. Put SIGHT SAVERS within easy reach of everyone in your plant. Install SIGHT SAVERS CLEANING STATIONS . . . distributed through leading Safety Supply Houses everywhere. In Canada, distributed by Safety Supply Manufacturing Company, Toronto.

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FREE *for your personal use—this handy* SIGHT SAVERS DISPENSER-PAK *containing 200 large Sight Savers tissues. Perfect for desk or glove compartment. No obligation. Write today for your* FREE SIGHT SAVERS DISPENSER-PAK!

Eye fountains are also desirable where chemicals are handled. Prompt flushing of the eyes is recognized as the best first-aid treatment for any chemical in the eyes.

Fungus infections. Warmth and moisture in shower rooms are conducive to the spread of fungi that cause "athlete's foot." Floors and stalls should be scrubbed daily with detergent and water as a general sanitation measure. A germicide in the scrub water is an added precaution.

Careful drying of the feet and use of an antiseptic foot powder help to prevent infection. Preparations for toughening the skin increase resistance to fungi.

Pans of antiseptic solution have been found ineffective or worse. A better method uses a device which dispenses a fresh solution over the feet when the shower user steps on the grating.

Disposable paper slippers or wooden clogs keep the feet from contact with the floor. They need not be worn in the stall where the floor area is kept mechanically clean by the flow of water.

Skin Cleansers

Four types of skin cleansers are in use: (1) Soaps (2) Sulfonated oils (3) Synthetic detergents and (4) Waterless cleansers.

Soaps. Powdered soaps are generally more economical than cake soap. These consist principally of powdered hard soap and water softener, to which a scrubbing agent may be added. Cornmeal, a commonly used scrubber, may be coarse or fine. Most soaps can be used with hard water.

Organic solvents, such as naphtha, turpentine and carbon tetrachloride, should be avoided. Some, particularly carbon tet, are toxic, some are flammable, and all have a drastic defatting action. If they must be used to remove substances like lacquer that resist ordinary cleansers, emollient creams help to offset loss of natural skin oils.

Liquid soaps are generally satisfactory where a scrubber is not desired. They are frequently used in office washrooms and in first-aid rooms.

Soap should contain no free alkali and should show a low pH in dilute solution. This can be determined before purchasing.

Sulfonated oils are useful for dry and soap-sensitive skins. They are frequently used where workers are exposed to the defatting action of petroleum oils and organic solvents.

Synthetic detergents of several types, mild but effective, are used in many industries. They are particularly useful for removing oil, wax and tar.

Waterless skin cleansers are effective in removing grease and grime and newer types are said to be non-irritating to most skins. The earliest waterless cleanser in general use was kerosene—alone or emulsified with ammonia soaps. Subsequently odorless spirits and alkanolomines were used and now there is a variety of materials for the purpose.

Requirements include: Safety to hands, effectiveness, absence of disagreeable odor, pleasant appearance and after feel, suitable consistency for dispensing, rapid break when on the hands, and stability to heat, cold and storage.

Portable dispensers with receptacles for waste towels can be set up quickly. No plumbing connection is needed. Dispensers for paper towels can be attached.

Germicidal cleansers. Ordinary soaps and synthetic detergents remove transient bacteria from the surface but are not effective in reducing those embedded in the skin. Many germicides, such as phenol compounds, have been tested as ingredients of skin cleansers, but required high concentrations that made them unsuitable for daily use.

Hexachlorophene, described by various trade names, has been incorporated in soaps and detergents for medical, surgical and deodorant purposes and for general industrial and home use.

Drying the Skin

The community towel is still found in some plant washrooms in spite of legislation and public

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A new CESCO Face Shield offers a unique, soft flexible vinyl headband, with no exposed mechanical adjustments to snag the hair.
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Kimball SAFETY PRODUCTS COMPANY

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Section 5—Personal Protection—Part 1

opinion. It is the mark of an unprogressive plant.

Paper towels meet sanitary requirements and are economical and convenient. Dispensers should be kept filled and receptacles for used towels provided.

Recessed waste receptacles take one more object off the floor, improving the appearance of the washroom and making cleaning easier.

Mechanical hot air driers are acceptable from the hygienic standpoint. Popular types are foot-operated and may be of the pedestal type or recessed into the wall. Equipment should be well grounded and the electrical connection permanently installed without extension cords or plugs.

Towel services are used by some establishments, usually stores and offices. For industrial use, individual towels kept in lockers may not be changed often enough and they may come in contact with soiled work clothes.

Toilets

Toilets should be partitioned off from washrooms and lockers. Partitions of enameled metal are attractive in appearance and easy to keep clean. Partitions may be suspended from the ceiling or wall-mounted. Either type makes floor cleaning easier and quicker.

The oval-rim type of toilet with open-front plastic seat is most widely used. Foot-operated flush valves are favored by many.

The flushing mechanism should be rugged since employees often kick the handle instead of operating it by hand. Flush valves should be equipped with vacuum breakers to avoid back siphonage.

Toilets should be not more than 200 ft. from any work place; preferably less than 150 ft.

Facilities for men and women should be plainly marked.

Urinals should be placed throughout the plant in convenient locations to avoid loss of time. One urinal for each 40 men is usually sufficient. Automatic flush valves use more water but are more effective in maintaining cleanliness since many persons seem reluctant to touch hand-operated valves.

Floors of toilet rooms should be of impervious materials, smooth and free from cracks. Tile and concrete are satisfactory. Floor drains permit frequent flushing.

Toilet rooms should have outside windows for light and ventilation if practicable. State or municipal regulations usually contain provisions for ventilation.

Switches for lights, electric driers or other equipment should be located so they cannot be operated by a person in contact with piping or other grounded conductor. Pull chains should contain an insulating link close to the fixture.

Where eating rooms are close to toilet rooms, covered receptacles for disposal of waste food should be provided in the lunchrooms. Eating lunches in the toilet rooms should not be permitted.

Cuspidors should be provided where needed and cleaned at least daily. The disposal type requires less handling.

Lockers

A well-equipped locker room is an aid to orderly habits and often to health.

Locker rooms should be fire-resistant, separated by fire walls from the main building.

Exposure to toxic substances calls for extra precautions to prevent poisons being carried away on clothing. Separate lockers prevent contact between street and work clothes. They should preferably be in separate rooms with shower stalls between them.

Supervised washup periods and shower baths are important safeguards wherever poisons are handled.

Sloping tops prevent their use for storage. Dust is conspicuous and easier to remove than with flat tops.

Built-in lockers extending to the ceiling avoid dust-catching surfaces.

Lockers should be at least 4 in. off the floor to permit flushing

No Time Wasted!

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WINDSOCKS

The Safety Hat Liners
That Need No Installation

9" length $2.64 doz.

11" length $3.00 doz.

Windsock is an inexpensive knit cap that's warm, lightweight and snug. It actually costs less than the *time alone* spent by a worker in installing or removing a permanent type liner. Buy a dozen and test them. See for yourself how Windsocks put an end to those chilly drafts that whistle between the safety hat shell and your head.

Write for Descriptive Bulletin No. 52

STANDARD SAFETY EQUIPMENT COMPANY

232 West Ontario Street, Chicago 10, Illinois

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Announcing THE NEW SELLSTROM 700 SERIES SAFETY GLASSES

NOW THE "EYES" REALLY HAVE IT...

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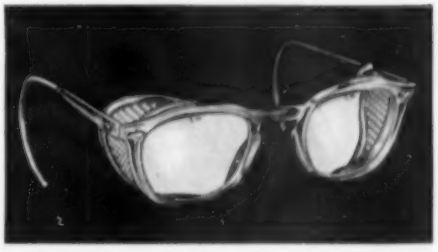
These new SELLSTROM "700 Series" Plastic Frame Safety Glasses feature the "Squared Shape" design that gives the wearer all the smart appearance of personal glasses. In addition, the "700 Series" provides greater wearing comfort, wider vision, stronger safety construction.



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In feature after feature, these new SELLSTROM 700 GLASSES show their "years-ahead" design. Nose pads are large and comfortable to wear. The frame is molded acetate butyrate; flexible and strong, it can be bent or twisted without damage and will withstand greater impact.

Bridge, temple and end piece construction give you greater safety protection than previously possible. Choice of Sellstrom safety lenses, too, in the new interchangeable S-7 style. For the finest in plastic frame glasses, remember . . . it's the new SELLSTROM "700 SERIES"!

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the floor without wetting the contents of the lockers.

Forced ventilation, supplied through perforations in the bottom of the lockers or through louvers in the doors, is helpful in removing odors. If the work is heavy or wet, circulation of heated air through the lockers is desirable.

Oil-soaked clothing, waste, or newspapers kept in lockers may create a serious fire hazard. Lockers should have solid fire-resisting sides and backs, but doors should have louvers for ventilation. Employees should not be permitted to leave clothing or rags saturated with oil or paint in lockers.

Baskets and hangers on elevating chains are used instead of lockers in some industries, such as mines and foundries. Damp work clothing can be dried between shifts and drying can be hastened by steam coils at the ceiling. This arrangement conserves floor space.

Rest Rooms

A rest room should be provided where 10 or more women are employed. Where there are fewer women and a separate room is not available, suitable space may be screened off.

For 10 women, minimum space is 60 sq. ft., with at least 2 sq. ft. for each additional woman employed.

For less than 100 women, at least 1 bed or couch should be provided. For 100 to 200 workers, 2 beds, and 1 bed for each additional 250 workers. * * *

Filter Glasses for Air Line Pilots

By HEDWIG S. KUHN, M.D.

IN THE EARLY days of the war, an aeronautical engineer came to see me about the possibility of designing glasses that pilots flying commercial planes could wear during an electric storm, so that the after-effects of lightning would not blind them. At the time, the optical research centers, commercial, university and military, were concentrating, of course, on war equipment, range finders, optical precision instruments, and were unavailable for experimental work on this project.

About five years ago, a senior pilot of a commercial airline discussed with me the glare problems of pilots flying into the sunrise and sunset. He felt, quite rightly, that there was a relationship between general fatigue, excessive glare on the outside of the cockpit, and dimness of the instrument panel on the inside.

By this time, some of the fruits of war-time research became available, including the intensive work done on filter lenses for use

DR. HEDWIG S. KUHN is a partner in the Kuhn Clinic, Hammond, Ind., and a consultant in industrial eye problems, injuries, and in-plant problems. This article is condensed from *The Air Line Pilot.*

16c INVESTMENT* CUTS LABOR COSTS

Here's proof that StaSafe Koolpads, mopping up perspiration, cut labor costs:

Take one man wearing glasses or goggles during the hot summer months. He frequently stops work to, 1) take out his handkerchief, 2) take off his glasses, 3) mop his forehead, 4) wipe his glasses, 5) replace his glasses, 6) replace his handkerchief, and finally 7) return to work. At today's wage scale, you pay a high penalty in lost labor and a higher penalty in lost production.

On a hot day, the number of "perspiration stops" prevented more than pays for the 16c investment of a Koolpad. You save labor, gain production and pay for the Koolpad. And even more important, *that same* Koolpad goes on to save you money day after day because StaSafe Koolpads are rinsed in seconds and used over and over again! It pays to look into Koolpads. They are the biggest "little" investment you can make.

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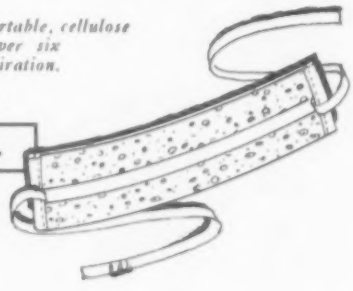

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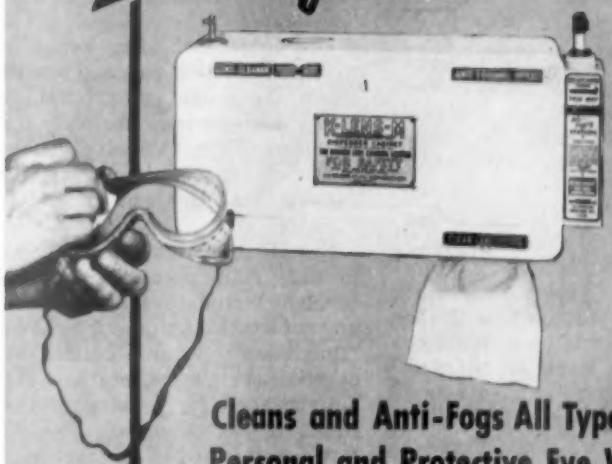

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by military pilots during the war. Among the filter lenses developed was one that filtered out *all* objectionable rays, excessive brightness (visible light), infrared rays—those frequencies of ultraviolet rays that were the most irritating—and all rays not essential to good seeing.

As a rule, 85 per cent of visible light must be filtered out for effective acuity in facing excessive brightness. A neutral lens, eliminating color distortion is required. All of these qualities are of very great value to commercial pilots.

Next, came the problem of figuring out the mechanics of providing a filter lens for reducing excessive glare outside of a cockpit, but still making it possible to see the instrument panel. The frame needed temple pieces comfortable under headphones and other details known to pilots wearing them. These details were worked out with the cooperation of Capt. Fred Pastorius, and indicated a specially designed frame and half-lenses, which solved as many of the problems as possible.

The lens filtered out enough of the brightness levels to cut down the discomfort of glare outside of the cockpit, so that planes were visible in the sky. It also filtered out infrared and ultraviolet, and it is possible to wear these lenses during night thunderstorms, enabling pilots to watch thunderheads and storm configurations. All other types of filter lenses, reflecting lenses, polaroid lenses, and gradient density lenses were eliminated for various scientific reasons.

The thought behind the design was to have as little glass or distraction as possible, so that the pilot would be almost unaware that he was wearing any kind of glasses. The exact level of the cut-off line was worked on by many different types of individuals of varying heights, concentrating on the problem of those planes where the visibility of the instrument panel, in contrast to the brightness levels on the outside of the plane, is most acute.

The end product—the present pilot sunglass as developed—is one that has now been tried by many pilots on an experimental basis before final specifications were decided on. The filter lens, designed chemically and optically to be as nearly perfect as science can make it, has a transmission curve that allows only those rays of visible light that are needed to be transmitted. The neutral color is most important and the optical quality of the glass is perfect, eliminating distortions, and finally, the frame design is custom-built.

The subject of filter lenses is a very interesting one, and one in which the public, in general, is badly misinformed. Actually, in the normal eye, excessive visible light *per se*, can do no organic damage, but glare can cause discomfort.

Not all individuals are uncomfortable; many vacation on water, beach or mountains without being uncomfortable. Actually, so-called "sunglasses" would better be called sport glasses, as they are not designed for looking at the sun itself.

A concentrated effort was made prior to the eclipse a few years ago to make the public aware of the fact that not every so-called sunglass would filter out infrared. In spite of the publicity, cases of blindness did occur. It is important to know that flying into the sunset or sunrise is not looking deliberately or directly at the sun.

Let us never forget that snow blindness in high mountains and polar areas, due to reflected infrared (heat) rays, is dangerous; that eclipse blindness due to infrared (heat) rays is dangerous; that ultraviolet rays (welding), while they cause great temporary discomfort to the exterior of the eye, do not penetrate the eye or cause damage to the tissues on the inside of the eye.

Infrared (heat) rays, caused by working very close to very high temperatures with exposure over very long periods of time, can cause damage inside the eye. Such cases are almost unknown in this country. In the "old country," glass blower's cataract did occur, but it took 25 years' exposure to high temperatures at very close range without protection, to produce them.

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A newly designed facepiece provides a snug, leak-proof fit. Dual headbands permit proper balance and adjustment for perfect seal along all facial contours.
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Box No. 427

National Safety News.

While some excellent glasses on the market do filter out visible light in the proper percentage, the buyer is unable to differentiate as the vast majority of so-called sunglasses do not carry a trademark stipulating filter qualities.

One cannot go into a store and ask for and be sure to get a lens that has a 15 per cent transmission of visible light, and that filters out ultraviolet and infrared rays, and have any guarantee at all that the purchased glasses can do this. None that I know of carry a guarantee. The time will come when we *can* go to a store, ask for a specific type of lens and know what we are getting.

The color and density of any given tinted filter lens need have nothing to do, *per se*, with the type or amount of rays that are transmitted. The transmission curve is based on the exact chemistry of the glass. Some lenses are designed to filter out ultraviolet; some, infrared, etc.

A welder's glass is a dark green, because of the iron required to filter out ultraviolet rays during welding. Lenses used in heat treating operations are dark, not to reduce the brightness of the heat, but because special chemicals are needed in the lens to filter out the infrared (heat) rays.

In 1952, the Joint Committee on Industrial Opthalmology, which represents the American Academy of Ophthalmology and Otolaryngology and the Section of Ophthalmology of the American Medical Association, appointed a subcommittee of experts in the field of filter lenses. After much research, the Joint Committee published a statement with reference to "Tinted Optical Media."

Highlighted was the Committee's warning against the use of any type of "reflecting, filter, or polaroid" lens to reduce glare of oncoming headlights, or anything that cuts visibility during night driving. The same is true of some colored windshields that reduce visibility at night.

There are, of course, innumerable other problems having to do with visual demands on pilots—dark adaption; drowsiness in red light at night, and new, and as yet unresolved and even unrecognized, visual problems arising with the use of jet transports.

"Look, you push me again and that's the last time you'll ever push me!"

Women Employees

—From page 6

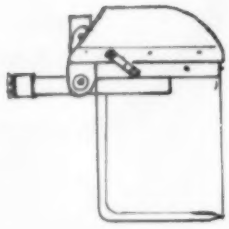
2 million of these have below-school-age youngsters.

Counseling—giving advice from a fund of accumulated knowledge—should not be subjective. It should enable woman to understand why she is a whole woman and what she must do to remain so. Therefore, counseling should be predicated on exact information based on mutual understanding and good sense. It can do much to improve improper attitude, which, while broad in its application, includes workers who are unhappy, careless, resentful and inattentive. Workers in these categories are more likely to have accidents than those who have high morale and are content with their work.

For years, hazards involving machinery defects—unguarded points of operation and moving parts, unguarded transmission belts, lack of handrails on stairs—have been recognized. Only during the last decade, however, has it been established that psychological and temperamental characteristics of an individual affect his efficiency or tendency toward unsafe actions.

Counseling must take woman "by the hand" and show her objectively the result of unsafe acts or thoughtlessness. If she doesn't wear goggles, counseling should

How to change a StaSafe face shield front in 20 SECONDS



A 20 second change is routine with StaSafe shields. In the photos below, notice how the spring retaining clips and StaSafe's unique shield design combine to simplify and speed up the job of changing fronts.

8 Seconds . . old front comes out!

Spring retaining clip is raised and half the front is snapped out. By 12 seconds the other clip is up and the entire front is off. It's all so easy because each front is precision cut for StaSafe shields. (You can identify StaSafe fronts by the Trade Mark). It fits perfectly and snaps out quickly. Every hole is punched at precisely the correct point to positively engage and instantly disengage from studs on the headgear.

20 Seconds . . new front goes in!

New front is snapped into place and locked with spring retaining clips. These clips, one on each side of the headgear, take all the work out of front replacement. Lift them to remove old front and snap in new one. Let clips spring into position to keep the new front secure.

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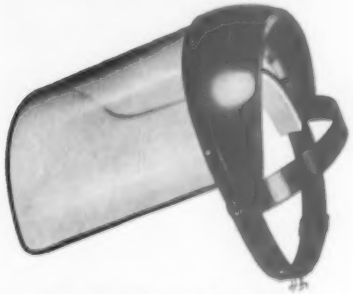

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point out, flying objects can injure her eyesight. If she reads in the dark, she should be made to understand that she is straining her eyes, that eventually her sight will be impaired and that she will be too tired to exercise necessary precaution.

Walking in the dark will expose her to mishaps. She should recognize and avoid that which can harm her. Exposing herself to moving machinery without wearing a cap which protects her head; exposing herself to falling objects without wearing safety shoes—these are examples of poor work practices counseling can point out.

Advising her to "Be careful" may miss the mark, though. On the other hand, the "self-interest approach" will give the idea a chance to germinate within her. It should be objective and predicated on a question: "Do you really want to stay whole?"

If the answer is affirmative, then counseling is objective to the degree that it tells you that what you're doing won't keep you whole or how what you're doing can be done in a way to keep you whole—whether it's eating, sleeping, washing dishes, waiting on tables or tending the sick. What you can envision, you can prepare for. We have to get woman to recognize objectively—not via preaching or slogans, but via counseling—that which aims at subtracting from her wholeness, and get her interested in doing something about it.

There's another step in this counseling service that woman is often without power to take. It pertains to that which foremen or members of other departments plan for her to use or be in contact with. She's the unsuspecting victim of someone else's doing. Counseling, then, has to call on the safety organization.

Selection and Placement

Skilled interviewers can obtain much information on the applicant's interests, character, intelligence, emotional stability and aptitudes. Her previous accident record can be obtained from her employment history. Her fitness must be studied if insufficient information is obtained from her

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accident record. The personnel department should learn her home duties, number of children or elderly persons she's responsible for, transportation to and from work, and availability of child-care centers, factors that affect attendance and labor turnover.

To combat such turnover the medical department should know job requirements and mental qualifications. Here are points it should know about a job:

—Physical exertion
—Skill and knowledge
—Operating hazards
—Exposure to moving machinery
—Amount of sitting and standing
—Contacts with toxic dusts, fumes, gases, odors
—Finger dexterity required
—Vision required
—Whether working alone or with others

The first interview is the best time to introduce the need for dressing appropriately for the job and any plant requirements of shoes, caps, uniforms or other personal protection. It's a good time to explain the safety program, first-aid facilities and other in-plant services. When observance of safety rules is accepted early as part of the job, compliance is more willing.

Employment Standards

Many states have laws on employment of women in industry. Such laws can be obtained from state labor departments.

Adequate rest is needed for health and welfare. This is accomplished through the widely used five-day, 40-hour week. Work environment should help preserve the worker's health and reduce job strain and fatigue. Safety should be a continuous program.

Standards might include provision of:

—Washrooms, toilets, rest rooms, dressing rooms and drinking facilities convenient to workers; lunchrooms with nourishing food, reasonably priced.

—A plant industrial hygiene program to protect workers and guard against occupational hazards, and first-aid treatment.

—Mechanical lifting aids wher-

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ever possible to eliminate undue physical strain.

—Suitable seats for use whenever the job permits.

—Protective clothing and safety equipment, furnished and maintained in good condition by the employer.

—Equipment and machinery in good working condition, with adequate guards to protect against injury.

—Safe and uncrowded work space —stairways, floors, halls, rooms and passageways — clear of obstructions and well lighted.

Expectant mothers should give first consideration to maintaining their health and safeguarding health and care of the child.

Working-Hours Standards

The Women's Bureau of the U. S. Department of Labor recommends:

—At least one day of rest a week.

—Meal periods of at least 30 minutes; no work period more than five hours without meal or rest breaks.

—Rest periods of at least 10 minutes in the middle of each half-day work period (in addition to the aforementioned lunch time) without lengthening of the work-day.

—Sick and maternity leaves without loss of job or seniority rights.

—Night work, except in industries that operate round-the-clock or perform essential services, kept to a minimum. No work between midnight and 7 a.m.

Clothing for Women

The woman in industry without safety-designed clothing is just as incompletely outfitted as the soldier without a steel helmet. Special clothing is needed by women to protect them from being caught in moving machinery, and to protect them from dust, gas, fumes or acid hazards, flammable materials, flying and dropped objects, ordinary dust and dirt, and fatigue.

Special clothing is needed, too, to improve morale and protect products from contamination and spoilage.

Educational campaigns—in which uniforms, caps, shoes and other safety clothing are featured —are essential. Most women, while wishing to dress efficiently for a job, want to be comfortable and at ease.

Posture. Effect of posture on health can't be overemphasized. Good posture, whether sitting or standing, will reduce fatigue, headache and backache. Inefficiency, absenteeism, low output and pepless attitudes can be traced to poor posture.

When work permits, changing from a seated to a standing position periodically is relaxing and increases productivity. Where constant standing is required, suitable footwear is essential. Foot trouble caused by standing on cement or other hard-surfaced floors can be alleviated by mats. Some women find it advantageous to change shoes during shifts.

Lifting. Weight that can be lifted safely varies with individuals. Other factors than physical ability are involved, including material being handled, its shape, distance of carry and number of lifts an hour or day.

Special facilities and equipment. They're a "must" for women in industry today. Many states have set up standards for employment of women.

Skin care. Personal and environmental cleanliness is of prime importance in protecting employees from industrial dermatitis, leading occupational disease. Soap and water, authorities report, would prevent most cases. Protective cream is most effective when the skin is cleansed thoroughly before application.

Of importance, too, is knowledge of the nature and contents of materials used in the plant, as well as their proper care and handling. The need for supervisory control of hazards involved in use of chemicals has increased correspondingly with the number of chemicals.

Safe placement of employees is aided by knowledge of previous skin diseases or allergies, and by checking sensitivity or reaction of individuals to substances.

Management is responsible for providing clean environment; adequate, maintained washing facilities; instruction of employees in good personal hygiene habits, and constant enforcement of plant rules.

Diary

—*From page 3*

The public relations man shot out a sharp question: "Will your activities, particularly at McCarthy Products, create a fear psychology in the minds of the community about their young people going into industry?"

The personnel man answered for me: "The fear of industrial work already exists. Greentown's few shops are small, and some of them badly run. They have had bad accident records, producing in the mind of the community a sense that industrial work is more hazardous than farming and service work. I have already begun a program of deliberately dramatizing the safety man's work as a counter to the fear."

I added, "At the personnel man's suggestion, I have begun to work directly with the county agricultural agent on a farm safety program for the area. Believe me, gentlemen, it is perfectly demonstrable that the farm boy is in substantially more danger at work on his home place than he will be in Lovellburg."

Before I could answer one question, three of them were thrown at me in rapid succession.

From the sociologist: "Isn't your procedure in effect a destructive one of attempting not to reassure about industry but to undermine faith in existing socio-economic structures?"

From the senator: "Why is it necessary to stir up discontent within the families of my constituents?"

From the Chicago banker: "Why spend investors' money trying to prop up an economic activity competing with us for labor?"

I answered the sociologist that we were taking a truly constructive step to deal with a social evil —namely farm accidents.

I answered the senator that we were offering his constituents help in improving their health.

And I answered the banker by pointing out that the farm safety activity was in effect pre-employment safety training, especially since it gave me entree into the high school vocational agriculture

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shop in Greentown where shop safety practices could be taught to those who would later be members of the group from which we would draw our future labor.

Soon after that the meeting broke up and the visiting dignitaries drove off to a luncheon. The construction superintendent and I ordered coffee and sandwiches sent in, and started on Round Three of our battle of the street layout—with me fighting for a diversion of the truck entrance 200 yards to the west, to clear the pedestrian traffic from any crossing of the truck route, and the superintendent battling for the existing plan with its more direct truck route and less paving.

We didn't settle the issue.

Fewer Killed in Catastrophes in 1956

CATASTROPHES—defined as those accidents in which five or more persons are killed—took more than 1,300 lives in the United States during 1956, about 150 fewer than in 1955, the statisticians of the Metropolitan Life Insurance Company report.

The more favorable record reflects a smaller death toll in major catastrophes—those in which 25 or more lives were lost. During 1956 there were five such catastrophes which accounted for about 270 lives; in 1955 nine catastrophes of this magnitude caused the loss of more than 600 lives.

Not in many years has the death toll from outstanding natural disasters been so low. In 1955 the major hurricanes, floods, and tornadoes accounted for the loss of more than 450 lives, compared with only 25 during 1956.

More than one-fourth of the loss of life during 1956 in all catastrophes resulting in five or more deaths were caused by motor vehicle accidents. Fires caused an additional one-fifth of the total.

Politics make strange bedfellows, but they soon get accustomed to the same bunk.

IN THIS SECTION

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Protective Clothing 150
Safety Belts and Harnesses . 156
Hands and Arms 160
Plastics That Protect Us 162

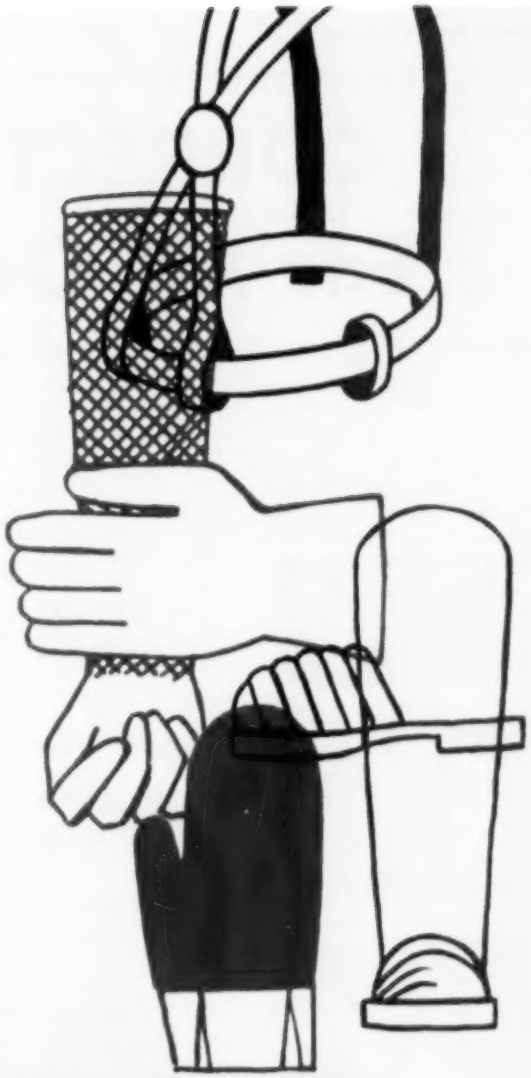
• • •

EVERY part of the body figures in accident statistics. Significantly, those parts for which protection is most widely used account for low percentages of both disability cases and total compensation paid.

The record for eyes saved is well known. For parts below the neck, toes account for a surprisingly small percentage of disability and compensation.

The reason, obviously, is the widespread wearing of safety shoes. Stories in employee publications about feet saved indicate that foot protection has been profitable for both company and employees.

Other parts of the body which cannot be encased in rigid protection are more difficult to guard. But many cuts, abrasions and skin infections could be prevented by protective garments.



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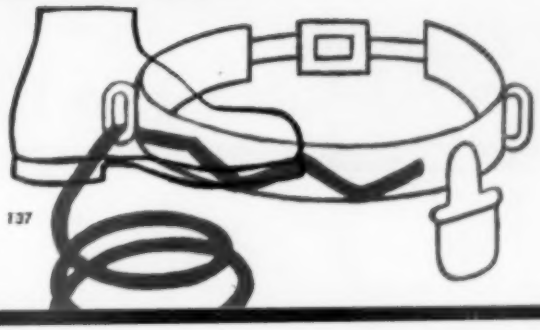
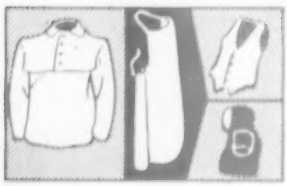
PERSONAL PROTECTION PART II



CORRECT WEAR For All Occasions

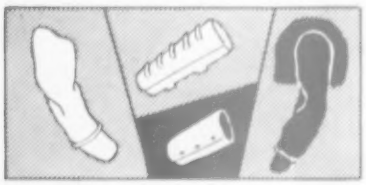
HATS, CAPS HELMETS

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Asbestos	X	X	X											
Plastic-Rubber				X	X	X				X		X		
Cotton-Wool	X		X									X		X
Metal								X	X		X			
Plastic	X							X	X	X	X			



COATS, APRONS WAIST PROTECTION

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Asbestos	X	X	X											
Chrome Leather	X	X		X					X		X			
Plastic				X	X	X				X		X		X
Rubber				X	X	X				X		X		X
Canvas-Fiber									X		X			X
Chemical Resistant						X								
Reflective Fabric				X										

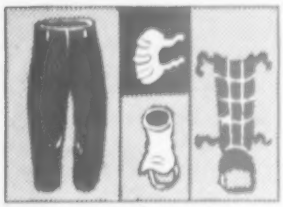


SLEEVES WRISTLETS

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Asbestos	X	X	X											
Chrome Leather	X	X		X					X		X			
Flameproofed Duck	X	X	X						X					X
Plastic				X	X	X						X		
Rubber				X	X	X				X		X		
Chemical Resistant						X								
Reflective Fabric				X										

GLOVES, MITTENS HAND PADS FINGER GUARDS

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Asbestos	X	X	X											
Chrome Leather	X	X		X					X		X			
Rubber				X	X	X				X		X		
Plastic-Rubber Coated Fabric				X	X	X						X		
Metal Mesh											X			
Cotton-Canvas											X			



PANTS, KNEE PADS LEGGINGS

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Asbestos	X	X	X											
Chrome Leather	X	X		X					X		X			
Flameproofed Duck	X	X	X						X					X
Fiber-Metal	X							X	X		X			X
Plastic				X	X	X						X		
Rubber				X	X	X				X		X		
Chemical Resistant						X								
Reflective Fabric				X										

SHOES, BOOTS

	1 Sparks	2 Hot Materials	3 Heat	4 Hot Liquids	5 Moisture	6 Acids & Alkalis	7 Slips & Falls	8 Falling Objects	9 Flying Particles	10 Electric Shock	11 Cuts & Abrasions	12 Dermatitis	13 Explosives	14 Machinery
Steel Toe Caps								X			X			X
Non-Skid Shoes					X		X							
Wooden Soles		X	X	X	X	X	X				X			
Chrome Leather	X	X	X	X										
Rubber				X	X	X				X		X		
Conductive Rubber													X	

FOOT PROTECTION

SAFETY SHOES for industrial use may be classified in five general categories according to construction and intended use:

1. Steel box toe (general use)
2. Conductive
3. Explosives operations (non-sparking)
4. Electrical hazard (shock-resisting)
5. Foundry

Special styles for women are provided in classes 1, 2 and 3.

As generally used, the term "safety shoe" means a shoe with a reinforced toe. Steel toe boxes are specified for most occupations because of their ability to resist heavy blows.

Around electrical equipment, where impact resistance must be compromised with the need for insulation, toe boxes of fiber or plastic are used.

Standards

American War Standards, Z41 Series, American Standards Association, are still the accepted guide for purchasers of safety shoes.

Specifications call for a well-constructed, durable work shoe with a toe reinforced by a steel cap. The cap is supported on a flange resting on the sole. It must support a static load of 2500 lbs. and resist the impact of a 50-lb. weight dropped one foot.

When subjected to either test, the inside of the toecap must not come closer than one-half inch from the upper surface of the sole.

Strength requirements for shoes for both men and women are identical.

Shoes meeting these requirements bear an identification stamp on one shoe of each pair. The stamp indicates the type of shoe according to the code classification.

Distribution

To secure acceptance of foot protection, safety shoes must be comfortable and properly fitted. Purchasing must also be made convenient.

Many large companies maintain well equipped stores with a wide range of lasts and sizes and trained attendants to fit the shoes. Shoes are sold at cost on the payroll deduction plan. Safety shoes are sometimes awarded as contest prizes.

Smaller plants are not always in a position to stock an adequate range of sizes or provide expert fitting service. Many companies make arrangements with local dealers whereby employees may purchase shoes through payroll deduction.

A mobile shoe service is offered by dealers in some areas. A truck equipped as a shoe store is manned by an experienced fitter who is responsible for all adjustments. A variety of styles and full range of sizes are carried. Periodic visits are arranged and between visits shoes can be obtained quickly on special order.

This service is rendered on a moderate mark-up basis and the plant can charge the employee any part of the cost.

It is desirable for a worker to have more than one pair of safety shoes so they can be rotated. Shoes will last longer and be easier on the feet. The wearer will also have a pair available while the other is being repaired.

Many companies encourage purchase of safety shoes for wear off the job. They know that the buyer's feet will be protected when the shoes end their days on the job.

Records for each employee should be kept. A 3 x 5 in. card shows name, department, payroll number, and details of each transaction. These include date, stock number, size, width, price, and payment. The reverse side of the card carries such information as history, details of foot trouble, and other comments.

Types of Shoes

Safety shoes, generally, are well made on lasts designed for comfort. They are available in many types and styles, some suitable for street wear. The protective toecap does not add appreciably to the weight or cost of the shoe.

General purpose shoe. The most widely used type is the blucher, high cut oxford. It is available in a wide range of sizes, widths and lasts, ranging from rugged, heavy-duty styles to those suitable for street wear. It is the basic type, with certain differences in detail for special occupations.

Foundry shoes. An early type of safety shoe still in use is the

A FEW of many types of safety footwear now available: high-top blucher, metal footguard, moccasin oxford, and sport type. (Pittsburgh Steel Co.)

foundry shoe with elastic panels at the sides. There is no opening on the instep where molten metal or hot sand can penetrate and the shoe can be pulled off quickly in an emergency. This model is furnished with steel box toe.

Spark-proof shoes. Shoes with brass hooks and eyelets and brass nailed heels are worn in some industries where sparks from iron or steel might ignite flammable gases.

Shock-resisting shoes. Some are non-metallic with fiber or plastic box toes; others have steel box toes which are partially insulated. These shoes are designed for work around electric equipment. They are also worn by those handling flammable materials, by workers in explosive plants, and in grain products refining operations.

Conductive shoes are designed to drain off static charges to prevent their building up in the body to the point where they could cause a spark.

The conductivity of these shoes is affected by other conditions. Wool, natural silk and nylon socks act as insulators to the body; cotton, lisle or rayon are satisfactory. Foot powder also serves as an insulator.

The floor as well as the shoes must be conductive.

Rubber footwear. Where work must be done in deep mud or in water, rubber boots contribute to health, comfort and safety. Rubber boots are available with steel box toes.

Soles and Heels

Slip-resistant soles and heels are good for general use since slipping hazards are frequently found where they are not expected. This type of footwear, however, is not a substitute for good housekeeping. No type of footwear will provide a sure footing where there are heavy accumulations of oil, grease and other slippery materials.

Leather is comfortable and durable for normal conditions. Leather does not give satisfactory service where heat is excessive or where the shoe is subjected to continuous dampness.

FOOTWEAR FOR VARIOUS EXPOSURES

Types of Footwear	Exposure
1. Conductive	Moisture: 8, 9
2. Nonsparking	Standing in water: 8, 9
3. Foundry shoes	Chemicals: 4, 8, 9
4. Wooden sole	Oil and grease: 4, 9
5. Insulated	Electric current: 5, 8, 9
6. Felt pac	Cinders: 4, 10
7. Linemen's boots	Hot surfaces: 4
8. Rubber boots and overshoes	Molten metal: 3
9. Neoprene boots and overshoes	Sharp and abrasive surfaces: 4, 12
10. Asbestos overshoes	Cold, snow, ice: 6
11. Shower sandals	Explosion hazards: 1
12. Steel innersoles	Slippery surfaces: 13
13. Slip-resistant soles and heels (Cord and cork)	Skin infections, athlete's foot: 4, 11
14. Footguards	Handling extra heavy objects: 14

Rubber is resistant to moisture, alkalis and most acids. It deteriorates quickly when exposed to grease, oil, solvents, some acids, or excessive heat.

Neoprene resists moisture, also grease, oil and solvents that would ruin rubber. It stands up well against cutting and abrasion.

Cord soles and heels of rubber or neoprene, similar in construction to automobile tires, give good traction under severe conditions for many operations.

Cork blended with rubber or neoprene provides good slip resistance and the soles are light and flexible. Cork also helps to insulate feet against heat or cold.

References—Personal Protection for Feet, Hands, Arms, Legs, Body

National Safety Council: Accident Prevention Manual for Industrial Operations, 1955.
—Fire Retardant Treatment for Fabrics; Data Sheet D-220.

National Safety News: Your Hands and Feet; Thomas B. Davidson, June 1949.
—Good Customers for the Shoe Business; Oct. 1952.
—Flameproofing Fabrics; William Stark, July 1954.
—Happy Feet; June 1955.
—Safety Belts and the Men Who Wear Them; Sept. 1956.

American Standards Assn.: Protective Occupational (Safety) Clothing; L18-1944 Series.
—Women's Industrial Clothing; L17-1944 Series.
—Protective Occupational Footwear, Men's; Z41-1944. Women's series out of print.

Wood soles are used for extreme conditions of heat, dampness, oil, acids or caustics underfoot. They are worn in steel mills, foundries, and other hot operations. They also afford protection against nails, broken glass, scrap metal, and other sharp objects.

Wooden-soled shoes can be obtained with steel toecaps or with guards which cover toes and insteps.

Wooden-soled sandals, strapped on over shoes, can be worn where exposure is brief or occasional. Another type is the shower sandal for protection against fungus infections.

Foot Guards

Where unusually heavy objects are handled, feet may need more protection than shoes with reinforced toes. For such work, there are foot guards of heavy gauge, flanged and corrugated metal.

The guards are strapped on over the shoes and protect the instep as well as the toes.

With the flange resting on a firm floor surface, foot guards should stand an impact of at least 300 foot-pounds without being dented sufficiently to damage the shoe underneath or injure the foot.

Foot guards are also made with soles of rubber or calked steel to minimize slipping hazards.

Combination shin-foot guards, with an aluminum alloy shin protector hinged to the foot guard, are available. * * *

PROTECTIVE WHEELER APPAREL

WHEELER *Announces*

TWO NEW ADVANCES IN PROTECTIVE APPAREL

EXCLUSIVE WHEELER WEAVE

UNDERWRITERS' GRADE ASBESTOS

BETTER WEAR SAVES YOU MONEY

New Wheeler Weave asbestos is made to stand much more abrasion than ordinary asbestos fabrics. It has a higher breaking load. This means that you can get better mileage out of asbestos garments of all types when they're made with Wheeler Weave.

Wheeler Weave is particularly good for gloves. *One pair will outlast ordinary basket weave gloves 2 to 1.* As a bonus you get exclusive green flame-proof linings, better, tighter seams, and the finest fabrication possible. Ask your Wheeler Safety Representative about new, more rugged Wheeler Weave today. You'll save money!

THESE TESTS SHOW WHY:

ABRASION TEST: One pound load—Universal Wear-Tester—4 psi Underwriters' Grade: Wheeler Weave—206 cycles. Basket Weave—159 cycles.

BREAKING LOAD: Method 5100—Federal Specification CCC-T-191-B—Underwriters' Grade.

	Warp	Fill
Wheeler Weave—	215	95
Basket Weave—	133	62

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Wherever you need *real finger protection plus free finger movement,* Wheeler has the answer in a new complete line of finger cots, thumb cots, fingertip and joint cots. For protection in *buffing, burring, sanding, polishing, machining, and punch press operations.* Also ideal for assembly work, laundry folding, small parts handling, intricate soldering or welding, and many other operations.

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"More Safety Per Dollar"

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new 22-minute COLOR SAFETY SHOE FILM dramatizes foot hazards as never before with romance, comedy, sex-appeal. Available free at any time on advance booking.

LIVE MAGIC SHOW with our own, world-famous Clyde Powell using sleight of hand to sell safety. Makes the greatest safety meetings you've ever had, with a laugh a minute! Available free on 6-months advance booking.

BOOTH No. 16

GREATER NEW YORK SAFETY CONFERENCE

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AUTOMATIC SAFETY POSTER SERVICE A regular service of bulletin-board safety posters designed to put safety shoes on more men and women in your plant. Any desired quantity forwarded free at regular intervals.

PAY ENVELOPE STUFFERS showing safety shoes — selling foot safety — to fit right in the envelope. Quantity sufficient to cover your payroll on request; no charge.

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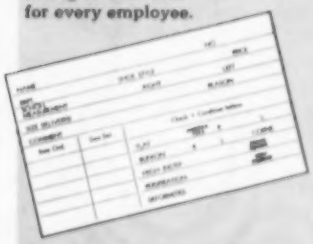
82 GREAT SHOES and BOOTS to choose from, for fast delivery anywhere from our huge stocks—backed by the broadest service program in the industry

Write today for your copy of complete catalog No. 17

Lehigh
SAFETY SHOE COMPANY
Emmaus, Pa.

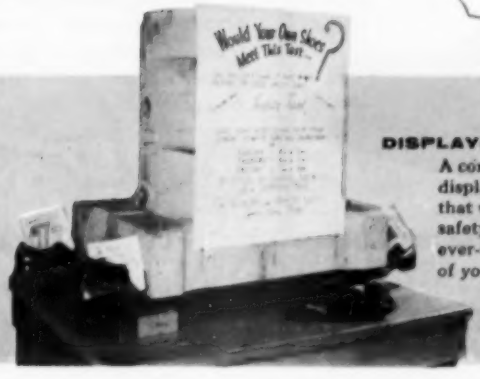
INTRODUCTORY FITTING SERVICE When you make the Lehigh line available in your plant, our nearest representative will work with you, training your own people in safety shoe fitting; setting up individual fitting-record cards for every employee.



SINGLE-PAIR SERVICE Just post this catalog-poster showing nearly 100 Lehigh styles where your employees can see it—we'll ship special orders for single pairs in any style, any size, anywhere in the U.S.

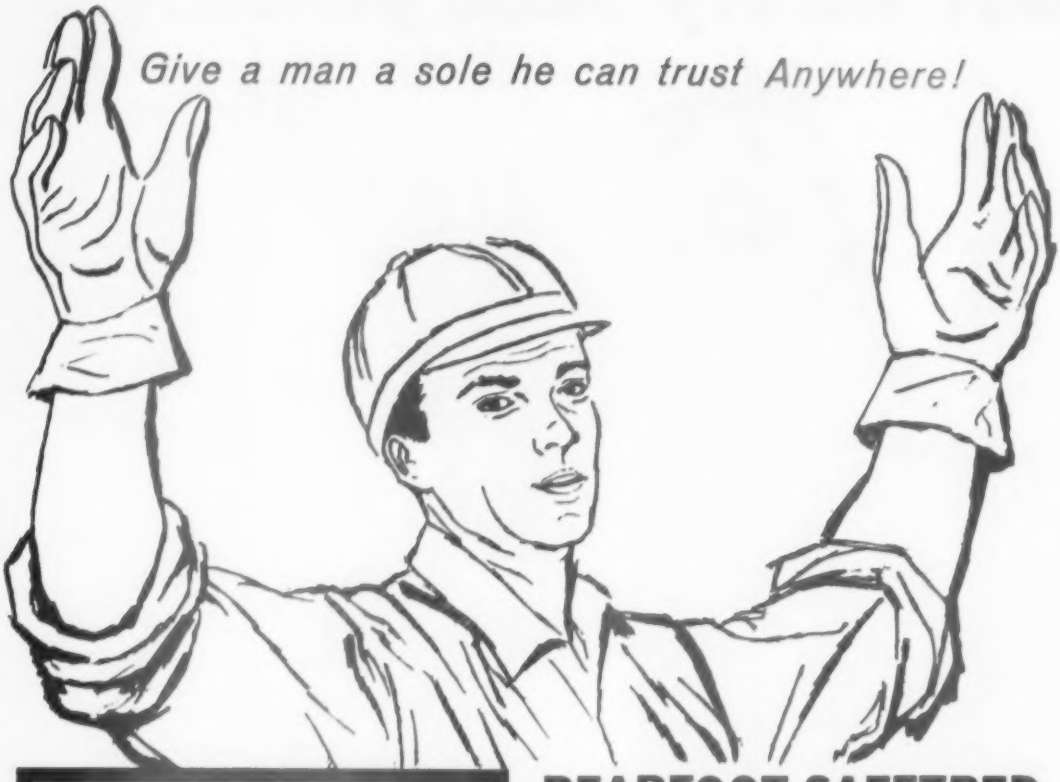
ON-THE-SPOT SERVICE from local field representatives throughout the U.S.—available on a phone call to help you with any shoe or foot-safety problem.

TERRIFIC DELIVERY SCHEDULE Where sizes and styles ordered are available from stock, we average 48-HOUR shipment—from one pair to hundreds. No need to carry a big inventory in your plant at any time!



DISPLAY-PROMOTION SERVICE A constant flow of ideas for displays and spot promotions that will help you to put safety shoes on an ever-increasing percentage of your personnel.

Give a man a sole he can trust Anywhere!



Safety Shoes by Hy Test Div —
International Shoe Corporation — St. Louis

BEARFOOT SAFETRED NEOPRENE

NITROCREPE

BEST FOR BUSY FEET

Today leading safety shoe manufacturers stake their reputation on the Surefooted Safety and the long hours of work comfort built into Bearfoot Neoprene Nitrocrepe.

It's the modern sole material resistant to oil, acids and alkalies. Resists cutting chips, keeps its shape for the life of the shoe. In a wide variety of colors in safetred, crepe and suede finishes to meet every safety shoe manufacturing requirement.

A trusted name on shoe bottoms since 1924

BEARFOOT SOLE CO., INC. • WADSWORTH, OHIO

Leg Protection

PROTECTION for the legs is required in certain occupations where workers are exposed to the hazards of hot materials, corrosives, blows from sharp tools or heavy objects, and bites of poisonous snakes.

Garments commonly used for protection are:

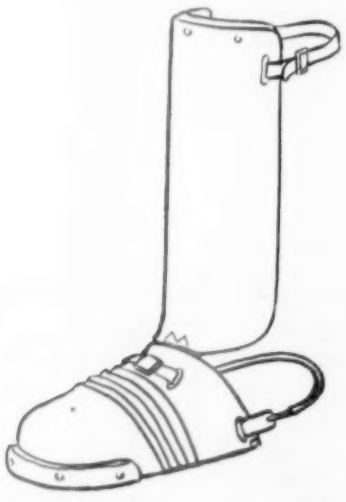
—Spats
—Leggings
—Shin guards
—Knee pads

Leggings. Most of the leggings used in industry are worn by those who handle molten metal—in foundries, open hearth and blast furnaces. These leggings are available in asbestos, chrome leather and fire-proofed duck and in spats, knee length and hip length.

Leggings for men who work with molten metal have flares to protect the instep and are free from projecting buckles and clasps. They can be removed instantly in an emergency.

Leggings for chemical workers are made from impregnated duck. They are available in ankle, knee and hip lengths.

In regions where poisonous snakes are a hazard, fiber leggings or high boots are worn by construction, public utility and farm workers. Coverings of waterproofed duck protect the leggings against long wet grass.



COMBINATION foot and shin guard.

Shinguards of metal or fiber provide important protection where axes or adzes are used. Shinguards are available separately or combined with metal footguards which cover the instep.

Knee pads are worn by electricians, pipefitters, riggers, cement workers, laborers and others who must kneel more or less continuously at work, particularly in confined spaces.

Two types are available. One consists of a rectangular pad or cushion about 10 x 14 in., made of chrome leather or asbestos cloth. This type is used for kneeling on hot surfaces. The other type is made of solid or sponge rubber molded to fit the contour of the knee. Straps keep the pads in place while the wearer is either kneeling or standing.

Materials

Materials commonly used are:

Asbestos—the preferred material for protection against molten metal, extreme heat and heavy sparks.

Leather, chrome tanned—for less severe exposure. Chrome leather, when new, is less resistant to splashes and sparks. With use it acquires a tougher surface. The operator should therefore keep out of the line of fire as much as possible until the garment is broken in.

Fire resistant duck—to ward off light splashes and sparks.

Rubber, neoprene, plastic and impregnated duck—for work with acids, alkalis and hot water.

Lightweight metal or **fiber**—for protection against blows from tools and heavy objects. * * *

Ill-Fitting Shoes Aren't Safe

Poorly fitted shoes are a frequent source of discomfort and disability, both on and off the job. In industry it has been estimated that 65 per cent of the men and 75 per cent of the women suffer from foot ailments.

Comfortable and apparently correct shoes are responsible for a surprisingly large number of cases. Although a shoe may feel comfortable, it may not give adequate support, or it may even upset the normal balance of the foot.

Short shoes are common offenders. When too short from the heel to the ball of the foot they can cause more trouble than shoes which are too narrow.

Shoe lasts that do not allow for normal foot movement within the shoe cause much foot fatigue.

Much of the success of any safety shoe program will depend on the fit and comfort provided.

Getting the Wear Out of Safety Shoes

Keeping shoes clean adds to their life as well as to their appearance. Muddy shoes should be cleaned with mild soap suds and wiped dry if possible.

Shoes can be preserved and made more water repellent by treating with animal or vegetable oils or shoe compounds once a week or oftener. Shoes of smooth leather should be cleaned with saddle soap. Polishing with shoe polish helps to preserve leather.

When shoes become wet from perspiration or from outside moisture, they should be dried away from heat. When drying, shoes should be placed on ventilated shoe trees to keep their shape. If shoe trees are not available, shoes can be stuffed with crumpled newspaper. Dried shoes should be treated with neat's-foot oil.

Leather can be made water repellent with silicone dressing.

WINGUARDS

The new improved WINGUARDS have proven to industry they are built to take it.

Standing toe to toe they have fought back under most severe punishment and outslugged the best of them.

For the year '56 alone WINGUARDS' popularity increased over 45% above the preceding 12 months.

Pick a real Champ for your corner in your fight for greater foot protection . . . WINGUARDS!

See you at Ringside

NEW YORK SAFETY SHOW

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Safety Box Toe Company

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WORLD'S LARGEST MANUFACTURERS OF STEEL SAFETY TOES

Water-Repellent Leathers... QUILON, SYLFLEX, ROSITE... shoes, boots, oxfords

Cush'n-Guard Flap Shoe... added protection with freedom of movement

Conductor and Insulative Types for hazardous operations... oxfords, shoes, boots

Popular, Lace-to-Toe Style for down-right comfort... shoe, boot, oxford

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NEW NOK-A-BOUT

HY-TEST's Latest... Popular 3-Eyelet Fawn Sueded Oxford; Resist-Oil Crepe Grit Sole and Heel... Easy tred, comfortable on and off the job.

Easy-on-and-off Nullifier... still popular with many

Engineer's Boot... heavy duty style, top choice among 10" boots

HY-Climber for Pole Climbing, Logging, Mining... many exclusive features

Flat-Tred Wedge... real comfort for the worker who is continually on his feet

Get the Best

ALERT

...to Your Needs

Everyone at HY-TEST... from design and production through service and sales... stays "alive and clicking" to the continuing requirements of Safety Shoes. Best proof of this is today's great display of more than 90 HY-TEST styles in over 6,500 designs, lasts, sizes and widths. Included are special types, exclusive and proved features, latest in leathers and the greatest selection of soles... always in a full range of sizes and widths and always backed by the highest "Standards of Quality".

If you have a Safety Shoe problem, ask HY-TEST. We have the answer.

Stylish Women's Pump...one of many designed "with the ladies in mind"

Insulated Throughout to protect against extremes of cold and heat...in boot and shoe

Specially Made to Resist Chemical Action ...in boot, shoe and oxford

Wellington Boot with Non-Metallic Sole and Heel...popular 7½" pull-on

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HY-TEST INTERNATIONAL SHOE COMPANY SAFETY SHOES

with HY-TEST

Protective Clothing

FOR MOST plant work, ordinary types of work clothing will give adequate protection against body injury. Garments should be clean, in good repair, and suitable for the job.

Work clothes should be designed to meet these requirements:

—Adequate protection for the hazards of the job.

—Comfort and freedom of movement.

—Durability.

—Appearance.

Appearance is particularly important in equipping women workers but men are not indifferent to it.

Safety (protective) clothing refers to garments designed for hazardous jobs where ordinary work clothes do not provide sufficient protection.

Hazards requiring the use of protective garments include:

—Hot metal splashes.

—Sparks, as in welding.

—Flying objects.

—Fighting fires.

—Tapping furnaces

—Shoulder bruises when carrying heavy loads.

—Splashing corrosive chemicals.

—Excessive moisture.

—Low temperatures.

—Sharp or rough edges

Proper fitting is essential in all work clothing. Long, loose sleeves may get caught in machinery. Trouser cuffs may cause tripping.

Clothing soaked in oil or flammable solvent is ignited easily. Any organic solvent, flammable or non-flammable, may cause skin irritation. Clean clothing is also a recognized aid to morale.

Laundry service. Laundered overalls, coveralls, aprons, smocks and other garments are furnished by the employer where extreme cleanliness is required in plant processes and where toxic materials are handled.

See chart on page 138 for types of garments and materials for various occupational exposures.

Standards

Specifications established by the Federal government have been widely used by private industry for many years. During World War II the American Standards Association approved a series of War Standards for Protective Occupational Clothing—Series 18. These are still accepted standards.

Specifications cover protection against sparks, molten metal, infra-red and ultra-violet rays, and limited impact forces. Details of pattern, design, workmanship and range of sizes are also included.

Materials

Asbestos has long been used for protection against intense heat and flame. Many garments are made of this material, including complete suits for fire-fighting and rescue work.

Wool clothing should be worn under asbestos garments where intense heat is encountered.

PROTECTIVE suit of aluminized asbestos enables man to walk unharmed through gasoline fire. Fabric reflects some 90 per cent of radiant heat. (Keasbey & Mattison Co.)

Reflective material, such as aluminum foil, is used with insulation material to provide a radiation barrier as well as to protect the wearer against conductive heat. Originally developed by the U. S. Air Force for fire-fighting and crash rescue work, these suits have found uses in industry and are available commercially.

Leather of various grades is used for protective garments. Chrome-tanned leather affords protection from sparks, molten metal splashes, and infra-red and ultra-violet rays. Any kind of leather, however, deteriorates under continued heat. For severe exposure, asbestos should be used.

Leather provides protection against limited impact. Padded leather or fabric aprons and hard fiber or metal protectors for the abdomen absorb much of the force of hard blows.

Leather reinforced by metal stitching or wire staples is resistant to cuts and abrasions.

Impervious materials of many types provide protection against dust, vapors, mists, moisture and corrosive liquids. They are useful in handling materials which would cause dermatitis or burns. This type of material includes rubber, neoprene and vinyl films and fabric coated with them.

Rubber resists acids, caustics and other corrosive substances, as well as moisture. Garments of rubberized fabric are used when handling low concentrations of acids and non-caustic liquids and for protection against weather. Rubber's high dielectric strength makes it useful where electricity is used.

Neoprene has numerous applications in safety equipment. It forms a tough durable film resistant to oils, solvents, acids and alkalis. It has high dielectric strength.

Vinyl plastic has many uses in safety equipment. For some garments the plastic is rolled or cal-

Clothing feels good... protects 'round the clock
Acme INDUSTRIAL LAUNDRY
FOR YOUR COMFORT AND SAFETY THIS GARMENT HAS BEEN TREATED WITH DU PONT X-12 FLAME RETARDANT

Give your men the SAFETY and COMFORT of work clothes treated with X-12 FLAME RETARDANT

If your workers are exposed to fire hazards, you'll be thankful you specified work clothes treated with Du Pont "X-12" Flame Retardant. You can relax, too, knowing there won't be complaints about clothes being uncomfortable.

"X-12" lends maximum safety to clothes and affords full comfort. It penetrates the fabric completely without sealing the pores. Thus, clothing "breathes" freely—an important advantage in hot weather. And "X-12" won't affect the appearance of work clothes, either. Colors remain bright and attractive.

Industrial and commercial laundries can apply "X-12" in an economical one-step operation. Because it is a renewable-type flame retardant, it is easily reapplied after each washing. For additional information about "X-12," clip coupon today.

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Wilmington 98, Delaware

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endered onto fabric. For others the strong pliable film is used without backing.

Flame-resistant duck, a lightweight fabric, is quite strong and will outwear ordinary material used in work clothes. For protection against extreme heat, asbestos should be used.

Water-resistant duck is recommended in exposures to water and non-corrosive liquids. It combines strength and durability with light weight.

Synthetic fabrics, such as dynel, orlon and vinyon, are used for durable work clothing. These fabrics resist acids, caustics, mildew, abrasion and tearing. They stand up well under repeated laundering. They should not be used where static sparks might cause an explosion.

Aluminized duck and drill are used for garments where radiated heat is a problem.

Flameproofing

Fabrics cannot be made noncombustible but some treatments provide limited fire resistance. There are two principal types of treatments, (1) Water soluble. (2) Weather resistant.

Commercial and home-made water soluble treatments are effective but must be renewed with each laundering. Weather-resistant treatments for canvas, duck, and other fabrics used for awnings, tent, tarpaulins, truck covers and welding curtains require special processing which can best be done by finishing mills or chemical companies equipped to do this work.

Dust removal. The practice of using compressed air to blow dust from hair and clothing may cause serious injury to eyes and ears. Brushes or vacuum equipment should be provided for this purpose and the use of compressed air forbidden.

Welder's Clothing

Protective clothing is as much a part of the arc welder's equipment as the helmet and goggles.

A STEELWORKER dressed for a hot job. He is wearing helmet, fire-resistant coat, gloves, leggings and safety shoes. (Pittsburgh Steel Co.)

Cotton shirts and dungarees worn in warm weather can be ignited quite easily. Garments of chrome-tanned leather may prevent serious burns.

Leather garments include overalls, pants, chaps, aprons, jackets, sleeves, gloves, mittens and spats.

Garments should be of good quality leather, solidly constructed. Fastenings must prevent gapping and should be so designed that the wearer can get out of the garment quickly. There should be no turned-up cuffs or other projections to catch hot metal. Pockets should have flaps. * * *

"My two hours are up and I've enjoyed every minute of our charming conversation."

After Work in Corrosive Atmospheres

When personal protective equipment is worn in a corrosive atmosphere, a rigid procedure should be set up for taking care of it after use to prevent contact with contaminated parts.

Before removal, even though it has not come in contact with corrosive chemicals, equipment should be washed thoroughly with a hose stream.

Remove boots, coats, aprons, and hats—then gloves. This is the logical order of removal if the coat has been put on properly with the sleeves outside the cuffs of the gloves.

Wash hands thoroughly before removing face shield and goggles. Then wash hands and face thoroughly again. A shower and change of clothing are better.

Combustibility of Fabrics

Acetate. Ignites readily, melts and burns quickly but somewhat less than rayon or cotton.

Acrilan. Ignites readily, melts and burns like cotton.

Cotton. Burns rather rapidly.

Dacron. Ignites with difficulty, melts and burns slowly.

Dynel. Difficult to ignite, melts but does not support combustion.

Fortisan. Burns rapidly but is more resistant to heat than cotton or linen.

Nylon. Quite difficult to ignite, melts but does not support combustion.

Orlon. Ignites readily, melts and burns like cotton.

Polyethylene. Melts and burns very slowly.

Rayon. Ignites readily and burns rather rapidly.

Saran. Ignites with moderate difficulty, self-extinguishing, melts but does not burn.

Vicara. Burns rather easily but less flammable than rayon and cotton.

Vinyon & Vinyon N. Difficult to ignite, melts but does not support combustion.

Wool. Burns slowly, tending to be self-extinguishing.

X-51. Melts at open flame.

NOW! America's two most popular casual styles in new safety shoes by Thom McAn

S-4311. The favorite kicker-back moccasin style in rich brown leather. Oil-resistant and long-wearing Neoprene sole and heel. Leather-lined steel toe box. B 8-12, C 7-12, D-E 6-12.

S-1378. New dress-weight Jaguar with the long, low look. Smooth black leather. Leather sole, Neoprene heel. Leather-lined steel toe box. Also in brown (S-4378). A-B8-12, C7-12, D-E6-12.

TODAY your men want the casual look and casual comfort in everything from shirts to shoes.

That's why we at Thom McAn, who make and sell more casual shoes than anyone else in America, have taken our two most popular styles and added them to our Safety Shoe line.

These two shoes give your men both *after-hours styling* and *on-the-job safety* at Thom McAn's famous money-saving price. Ask to see them. Examine them carefully. Then show your men these great new dual-purpose shoes they're sure to like—made by Thom McAn, the name they already know and trust.

NOW SOLD THREE WAYS: 1. Directly from Thom McAn warehouses for plant inventory, or on mail-order basis. **2.** Through Thom McAn's special In-Plant Fitting Plan. **3.** At Thom McAn Shoe Stores.

Send today for details on Thom McAn's special money-saving plans—plus a full description of the new Thom McAn Safety Shoe line. Write: Thom McAn Safety Division, 25 West 43rd Street, New York 36.

Visit Thom McAn Booth 28, Greater New York Safety Conference, Hotel Statler, March 18-22

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Thom McAn
SAFETY SHOES
A Division of the Melville Shoe Corporation

BOTTOMS UP...

Only the finest, nationally advertised soles are used on Iron Age Safety Shoes

The Safety Shoe **Iron Age** *For Industrial America*

No. 620

SEIBERLING OIL-PRUF SOLES—The first oil-resistant soling material that will also withstand dry abrasion. A brown sole that wears better than black. An ideal sole for those walking in and out of oily surroundings. Made by SEIBERLING RUBBER COMPANY.

No. 921

"LEATHERPLUS" SOLES—A premium all-leather sole, cut from the heart of the hide. Patented tannage by VAN TASSEL LEATHER COMPANY imparts more durability and flexibility than ordinary oak leather. Wearers enjoy greater comfort, double the sole life.

No. 636

NEO-CORD SOLES—Made by GRO-CORD RUBBER COMPANY to resist oil—heat—acids and caustics. In this sole Neoprene and cord are combined in the famous multiangle process. Has high slip-resisting factor, long wearing characteristics.

Iron Age

"Name Brand" SOLES ONLY

NAMES YOU CAN TRUST—There's never any gamble when you buy nationally advertised materials. The manufacturers of "name brands" just can't afford to put out inferior products. Why then should you accept safety shoes with substitute soles and heels? Particularly when you can get *all* the nationally advertised brands from Iron Age.

Our aim is to produce the finest, longest wearing, *safest* safety shoes it is possible to make. We buy and use only the best materials including "name brand" soles and heels. Collectively they provide you and us with the best obtainable selection of under-foot materials for the working conditions involved.

See your Iron Age representative or write us for a descriptive folder.

Iron Age Division - H. Childs & Co., Inc.

1205 Madison Avenue, Pittsburgh 12, Pa.

No. 625

BEARFOOT NEOPRENE CREPE SOLES—Made from type "S" Neoprene by THE BEARFOOT SOLE COMPANY, INC. to provide a thick, comfortable sole that insulates against heat, is oil-resistant, prevents slipping and wears twice as long as ordinary crepe.

No. 623

VUL-CORK MICRO-CELL CUSHION NEOPRENE SOLES—Cellular construction of this flexible, Neoprene cork sole permits a 40% reduction in weight. Extremely slip-resisting. Non-absorbent. Resists oils and caustics. Made by CAMBRIDGE RUBBER COMPANY.

No. 679

BILTRITE NEOPRENE "GREEN PLUG" SOLES—A "sure step" work sole by AMERICAN BILTRITE RUBBER COMPANY made from a firm, long-wearing compound that resists oil, grease, chemicals and acids. Green, non-slip plugs assure maximum safety.

Safety Shoes

Safety Belts and Harnesses

SAFETY BELTS or harnesses with life lines are required:

—For work at high levels
—In closed spaces where air may be irrespirable
—Where there is danger of being buried by slides of loose material.

Occupations in which safety belts are used routinely or occasionally include:

—Structural steel and bridge workers
—Window cleaners
—Public utility linemen
—Cranemen
—Forestry workers
—Miners
—Mechanics
—Painters
—Workers entering tanks, bins and underground passages.

In selecting equipment, two types of use must be considered—normal and emergency.

Normal use involves comparatively light stresses applied during regular work. These stresses rarely exceed the static weight of the wearer.

Emergency use means stopping a man when he falls. This may subject every part of the belt to an impact loading many times the weight of the wearer.

Types of Equipment

Types of belt and harness have been developed for various occupations. Most familiar are the lineman's belt and safety strap and the window cleaner's belt.

These belts are built for extra severe use. Both belting material and hardware are the result of much research and experience in the field. Belts are usually serially numbered and dated so that records of age and condition may be kept.

Materials. Leather and cotton or linen webbing belts are furnished by most manufacturers.

CLEAN-UP crew in chemical plant protected by hard hats, safety belts and life lines and dual tone signal horn powered by freon gas.

Well tanned and well oiled leather resists most chemicals but it should not be left in contact with them. Regular cleaning after use is important.

Leather ¼ in. thick and 1½ in. wide will have an ultimate strength of about 500 lbs. This is adequate for lifting a man out of a tank or bin.

Webbing will stand more heat than leather, and when soaked in water, will dry out in its natural condition. Friction buckles can be used with webbing, avoiding the loss of strength at buckle holes.

Belts intended to check a fall demand strength proportionate to the possible distance of fall and weight of body. A 2 x ¼ in. leather belt would probably arrest the fall of a window washer at 6 ft. It might break at a 10 ft. fall.

For a comfortable margin of safety, a window cleaner's leather belt should be at least 3 x ¼ in., or the equivalent.

Webbing of special type is available for certain uses. It can be treated to resist paint and mildew. For the chemical and petroleum industries webbing impregnated with neoprene resists acid conditions.

Quick release from a safety belt may be desirable in case of fire. Petroleum workers, for instance, use belts with a quick release buckle which can be disengaged instantly by a single motion of the hand.

Belts for some occupations contain loops and pockets for light tools.

For many occupations a lighter belt will provide ample protection against falls. These may be of the simple body type or the harness type. Both have dees to which a life line is attached. The harness type distributes the shock over the shoulders, back and waist instead of concentrating it at the waist.

Body harness with life line attached worn by workers in certain locations expedites their rescue if they should be overcome by gas or vapors, buried by falls of loose materials or injured in confined spaces.

Wherever the work requires a supplied-air respirator, harness and life line rather than a belt should also be used.

If long free falls are possible, the harness should be designed to distribute the impact force over the legs and chest as well as the waist.

The longer the free fall, the greater the impact force exerted upon harness and life line. It is therefore advisable to tie off the line as short as movements of the worker will permit.

Boatswain's chair. Where a belt must support the entire weight of a man while he works, as in raising and lowering him along the wall of a building, a boatswain's swing chair should be used. In this type of belt, one strap is used as a seat, sometimes with a board to make it more comfortable. Attached to the seat strap at each side is a strap around the waist to prevent him falling out of the seat. The waist strap

Now!

in their 5th year

the original

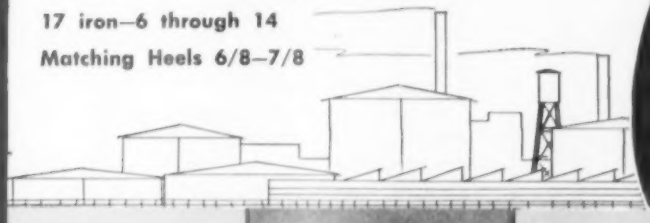
NEO CORD®

with Nylon cord

Now in their fifth year . . . and more popular than ever . . . **the original** Neo-Cord Sole and Heel with nylon cord* have provided sure, comfortable footing for millions of pairs of workshoes. Neo-Cord is tough and long-wearing—it resists oil, heat, acids and caustics—it has exceptional slip-resistance and complete flexibility for the life of the sole. Neo-Cord Soles and Heels—your best choice for the "all-purpose" workshoe application.

*Nylon cord means less oil absorption and longer wear than ordinary cord.

SIZES: 14 iron—6 through 14 and 16
17 iron—6 through 14
Matching Heels 6/8—7/8



RESISTANT TO OILS, HEAT, ACIDS, CAUSTICS

AVAILABLE IN BROWN OR BLACK

REGULAR OR EXTRA WIDE CONTOURS

"Sell 'em the shoe with the Sole for the job"

Gro-Cord offers the only complete line of industrial workshoe soles that enable you to assure workmen of greater satisfaction through comfort—safety and longer wear, regardless of job conditions. Get acquainted with the complete line of Gro-Cord soles and heels, today!

GRO-CORD RUBBER CO.
LIMA, OHIO

Canadian Plant
GRO-CORD RUBBER CO. of CANADA LTD.
Tillsonburg, Ontario

permits the wearer to stand or sit.

Collapsible canvas tool buckets are also needed on some jobs so the worker may have his hands free while climbing. Edge tools should be protected by guards while being carried.

Shock absorbers incorporated in harness and lanyards reduce the severity of impact. This decreases both the possibility of injury to the wearer and failure of the equipment.

Life lines. For most life lines, ¾ in. manila rope or ½ in. nylon rope is recommended.

Nylon rope has more stretch than manila which enables it to absorb shock and sudden loads. It has high tensile strength, wet or dry, is tough, flexible, durable, and easy to handle—is resistant to moisture and mildew and can be stored wet.

Steel cables should not be used as life lines where a free fall is possible unless a shock absorber is also used, because their rigidity increases the impact load. Metal cables should not be used around electricity.

Care of Belts

Dust should be brushed off carefully so as not to scratch the belt. A leather belt should then be washed with warm water and saddle soap or castile soap. It should be rinsed in clean warm water and allowed to dry in room temperature.

Leather belts should be treated with neatsfoot, castor, soybean or a compound oil, not a mineral oil. Leather should never be exposed to excessive heat.

Webbing belts may be washed in soapy water, rinsed and dried by moderate heat. They are not damaged by any temperature up to the boiling point of water. The manufacturer of the belt should be consulted about the dressing.

Belts should be inspected before use by the employees who wear them. Every one to three months they should be carefully inspected by a trained individual.

Leather belts must be watched carefully for cuts or scratches on the skin side of the hide. A deep cut on the skin side warrants condemning the belt.

LIFE of safety belts is prolonged by regular cleaning and application of neatsfoot oil or other good leather dressing.

Fabric belts should not be used if the outer plies are cut or worn through. All belt hardware should be checked and replaced if it shows signs of wear. If the belt is riveted, each rivet should be examined separately.

Life lines should be washed with mild soap and water and dried in circulating air. They should not be exposed to high temperatures. Rope should be kept in open coils and never bent sharply. * * *

What to Look for In Auto Seat Belts

What should a motorist look for in purchasing a safety belt?

The variety (and varying quality) of belts on the market today makes it advisable to buy from a reputable dealer. As a further guide, the Automotive Crash Injury Research Group at Cornell University recommends that:

—Loop strength of belt and buckle be at least 3,000 lbs.

—The belt be at least 2 in. wide.

—Only one person be supported by a belt.

—The buckle be simple to operate and easy to release.

—The belt be anchored to the car frame, not the seat.

Too, seat belts must be comfortable and convenient to use, and be worn at all times. Safety-belt users report the belts provide a more comfortable, less tiring ride. For maximum protection, they should have not more than 4 in. of slack—not too tight or too loose.

What to Look for When You Buy

No special hazard is involved in use of many of the items in an industrial plant. Selection may be governed by price, appearance, durability, or any other factor.

However, when the question is studied closely, numerous products are found to have an important bearing on safety or health.

For personal protective equipment, careful selection is important. Goggles, hard hats, respirators, safety shoes and garments are bought primarily for protection. Some of these items are covered by ASA standards, by approval labels of the U. S. Bureau of Mines and independent laboratories, and other certification. In this field, there are many companies which have been in business for years and their products' reputations are unquestioned.

Safety is another important factor in selection of equipment for movement of suspended loads, such as rope, chain, and slings. In equipment for movement and storage of materials, operating efficiency and economy often are the impelling reasons for buying but the effect on hazards is scarcely less important.

Solvents used for cleaning may constitute or aggravate a fire or health hazard. Most of these substances which have been in use for some time have been rated according to hazards involved in their use.

Unsuspected hazards may lie in use of ordinary items, such as common hand tools, tool racks, cleaning rags, and paints used for industrial interiors and machines.

Specifications will consider, among other things:

—Long life without deterioration.

—Maximum load strength.

—Hazard to the worker's health.

—Minimum fatigue in use.

—Absence of rough, sharp, or pointed characteristics in objects that must be handled.

—Ease and economy of maintenance.

STYLE R-11

STYLE R-13

STYLE R-14

STYLE R-15

STYLE R-58

STYLE R-86

RICO Safety Shoes

made of leather processed with DUPONT

*Quilon® chrome complex

are the best safety shoes money can buy! Here's why—

Gives leather extra stamina to resist harmful effects of

WATER • STRONG ACIDS • CHEMICALS

- Protects leather from getting stiff and uncomfortable—from drying out and cracking.
- Remains soft and pliable when exposed to repeated wetting and drying—yet for wearer's comfort, "the leather breathes!"
- Leather keeps its good appearance longer.
- The only safety shoes available that offer function as well as fashion.

*"QUILON" is DuPont's registered trademark for its chrome complex.

STYLE R-56

To assure your men outstanding protection against more hazards—specify "RICO Safety Shoes made of leather processed with Quilon."

There's Nothing Finer!

Further information and illustrated brochure available on request.

RICO

RECORD INDUSTRIAL COMPANY

DEPT. RQ, 3301 ARCH STREET • PHILADELPHIA 4, PA.

Hands and Arms

FINGERS, hands and arms are involved in approximately one-third of all reported occupational injuries, to say nothing of a large number of unreported first aid cases. Although the worker returns to the job, there is time spent in treatment and perhaps reduced efficiency for a few hours.

These parts of the body, so essential in performing every type of work, are exposed to many cuts, scratches, burns and bruises in the course of a day's work.

Finger movement is necessary for practically all jobs, which makes protection more difficult than for most other parts of the body. For the forearm, semi-rigid protectors are often practicable.

Types of protection available in a wide variety of styles and materials include:

—Gloves
—Mittens
—Hand pads
—Arm protectors
—Sleeves
—Protective creams
—Finger guards

Generally, gloves, mittens or hand pads should not be worn around revolving machinery. An exception is buffing and polishing on high speed lathes where parts become too hot to handle with bare hands.

Ordinary cotton work gloves offer some protection for the hands on light jobs but many industrial operations require hand protection of more durable material in a variety of specialized designs.

Common materials are:

Canvas is relatively low in price and suitable for light work. It is washable.

Duck and **terry cloth** are used for handling objects which are not too rough, sharp, or hot.

"Hot mill" gloves are made from a heavy twisted weave fabric which also gives good service for handling rough objects.

Leather is more expensive and more durable for most industrial uses. It offers greater protection against cuts and abrasions.

Chrome leather is used where there is exposure to sparks or molten metal. However, no material of animal or vegetable origin will stand continued excessive heat.

Metal staples in gloves, mittens and hand leathers give increased protection when handling sharp or rough objects. Metal-studded gloves should not be worn around electric apparatus.

Asbestos is used where hands must be protected against extreme heat, as in steel mills, heat treating plants, welding, galvanizing, glass manufacturing, etc.

Asbestos gloves may be obtained unlined or with wool lining for added comfort and protection.

Heat-repelling mittens of aluminum-coated fabric between two layers of asbestos, jersey lined, offer unusual protection against heat. These mittens are reversible.

Rubber, neoprene and vinyl films are suitable for chemical laboratories and plants where acids and other corrosives are handled.

Neoprene and vinyl are particularly useful where petroleum products and organic solvents are handled. Synthetic films vary in their resistance to chemicals and the manufacturer should be consulted about exposures.

Fabrics coated with rubber, neoprene or vinyl are used for light cleaning operations. They offer greater protection against abrasion than uncoated fabric.

When rubber or plastic gloves are worn for long periods, a lightweight cotton liner is desirable. If no liner is available, talcum powder should be shaken into the gloves before wearing.

Rubber, plastic and asbestos gloves should extend well above the wrists. Gauntlets should have locking devices to assure a snug fit about the wrists. Sleeves should be kept rolled down, leaving no skin exposed.

Metal mesh gloves are used in meat and other cutting. They should fit snugly.

Linemen's gloves. Rubber gloves worn by linemen and others engaged in electrical work are of a special type made to exacting specifications. They should be tested regularly and discarded when found worn, cracked or punctured.

For line work, overgloves of leather protect the rubber against damage.

Gauntlets offer some protection to the wrist.

Lead-rubber gloves protect the hands against x-rays and the gamma rays of radioactive materials. They are worn by medical, industrial and nuclear technicians. The glove may include a leather outer covering to prevent damage to the lead-impregnated rubber.

Lead-leather gloves are also available for radiation exposures.

Arm protectors guard the forearm against light blows. The materials, depending on the protection required, include duck, wool, leather, rubber, plastics, and asbestos.

"I'm going to start sleeping at the shop. There's too many accidents around the house."

Now-safer safety shoes

"QUILON" helps safety shoes resist acids, alkalies . . . protects against water and perspiration

Du Pont "Quilon" chrome complex combines with the leather fibers to give you safety shoes that resist perspiration, strong acids and alkalies . . . protect against damage caused by repeated wetting and drying. Yet the leather breathes!

Extensive laboratory and wear tests show that leathers properly processed with "Quilon" result in *safer* safety shoes. That's why many leading manufacturers are now featuring safety shoes with the lasting protection of new, versatile "Quilon". Look and ask for these safer, more practical shoes . . . right now!

QUILON®

Makes good leather perform better

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . *THROUGH CHEMISTRY*

• Du Pont supplies "Quilon" only to tanners, does not make leather or shoes.

H 230

H 930

H 963

H 950

Safer Safety Shoes by

HY-TEST

A Division of International Shoe Company

. . . featuring uppers processed with "Quilon" and neoprene soles and heels; exclusive anchor-flange steel-box toe; Bol Tan sweat-resistant leather insoles and Durisco mildew-proof treated linings.

E. I. DU PONT DE NEMOURS & CO. (INC.), GRASSELLI CHEMICALS DEPARTMENT, WILMINGTON 98, DELAWARE

Finger stalls may be used where a complete glove is not necessary. These are available in combinations of one or more fingers. Materials used are rubber, leather, plastics, duck, asbestos, and metal mesh.

Hand pads are often more satisfactory than gloves for protection from heat, abrasion or splinters. They can be heavier and less flexible than gloves.

Hand pads are obtainable in leather, asbestos and twisted weave fabric.

Protective Creams

Creams are helpful in protecting the skin against many irritants when safety clothing is not practicable. These products are made in water-soluble and water-resistant types, each in several grades for differing exposures.

Water-soluble creams are used for protection against cutting oils, paints, lacquers, varnishes, etc.

Water-resisting applications are used where the cutting oil, cooling lubricant, or other irritant has a water content of more than 10 per cent. These can be removed with soap and warm water.

To be effective, coatings should be renewed frequently. They are not intended for protection against highly corrosive substances. * * *

Plastics That Protect Us

MODERN LIVING and many industrial processes have been revolutionized by the introduction of an enormous variety of moldable synthetic materials described as "plastics." Many of these have important uses in protecting the worker against accidental injury and occupational diseases.

Plastics have a wide range of characteristics. They may be transparent, translucent or opaque. They can provide tough, pliable films or hard, shatter-resisting masses. For years they have been used for protection against the hazards of falling and flying objects, corrosive chemicals, dusts, gases, vapors, and other injurious agents.

Transparent plastic with good optical qualities is used for goggles and face shields. It can be used for corrective as well as plano goggles.

One reason for the wide use of plastics is their resistance to deteriorating agents. From hundreds of compounds, it is possible to obtain a suitable one for a particular purpose.

Most natural materials offer only limited resistance. Rubber, for example, while an excellent impermeable material for many uses, is affected by oil, sunlight, heat, and some acids. When worn next to the skin for long periods it may cause irritation.

Some untreated fabrics, like cotton and linen, are flammable and readily affected by acids.

A plastic to meet any specific purpose can usually be compounded. Compounds can be made impervious to oils, acids and most organic solvents. Some are shatter resistant, nonconductive of electricity, and heat and cold proof. It is often possible to combine many of these properties in one compound.

Some plastics are nontoxic, odorless, and tasteless and are suitable containers for food products. They can be molded to very close tolerances, an important factor in economical production. Most of them can be produced in a wide range of colors.

Articles of safety equipment in which plastics are used include:

—Goggles and face shields
—Hard hats
—Respirators, gas and dust masks
—Garments of plastic film or coated fabric
—Containers for first aid kits
—Instruments for the dispensary

Types of Plastics

Following is a list of the more common types of plastic materials with their properties and uses:

Acrylics

Optical clarity, shatter resistance, weather resistance, machinability, wide color range.

Uses—Goggles, face shields, aircraft turrets, auto tail lights, signs, brush backs. Dynel, Acrilan, Orlon textiles for work clothing.

Alkyds and Rosin Modifications

Good electrical insulation, heat resistance, dimensional stability, fast curing.

the LIGHTER SIDE
NATIONAL SAFETY COUNCIL
...NOW, TELL ME, HOW MANY YEARS HAVE YOU BEEN ENGAGING IN THIS HORSE PLAY AROUND YOUR PLANT?
PSYCHIATRIST
ANYONE ELSE WOULD CARRY THEIR PENCIL BEHIND THEIR EAR—BUT THAT GUY IS THE PLANTS PRACTICAL JOKER
OH BOY, A HORSE SHOE! THIS IS MY LUCKY DAY!

Uses—Paints, ignition parts, magneto rotors, linoleum surfacings.

Aminos (Urea and Melamine)

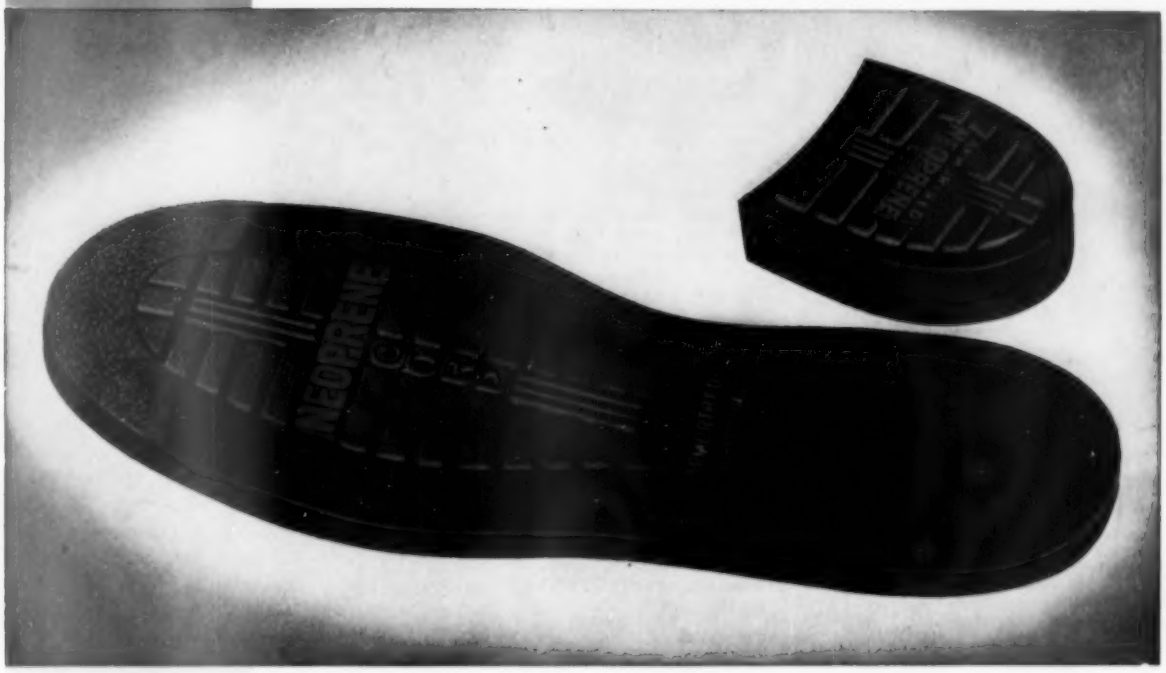
Good electrical insulation, resistant to organic solvents, unlimited color range.

Uses—Buttons, dishes, laminated table tops, housings for kitchen appliances.

Cellulose Plastic Materials

Toughness, high impact strength,

Armortred NEOPRENE CORD SOLES and HEELS



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Emblem of BUSINESS CHARACTER

Rice Leaders of the World Association

Represents High Standing in NAME - PRODUCT - PUBLICITY

SAFETY, SERVICE and STYLE...

- **ARMORTRED** Soles and matching heels are made with **DUPONT NEOPRENE** for peak protection against heat, oils, solvents, etc. and for extra miles of safe service.

MADE ALSO IN NYLON CORD—WITH GREEN LABEL

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MANUFACTURED AND DISTRIBUTED BY **QUABAUG RUBBER COMPANY** NORTH BROOKFIELD, MASS.

GENTEX
WORLD'S
Safest
LIFE JACKET

WITH PATENTED POSITIVE
"Face-up" Pat. FEATURE

PERMANENTLY BUOYANT

FOR
✓ SHIP
✓ BRIDGE
✓ DOCK WORKERS
✓ AND FOR ALL WHO WORK ON OR NEAR WATER

New, exclusive GENTEX plastic foam construction . . . plus patented FACE-UP "turning" action keeps wearer afloat and alive, even if stunned or unconscious . . . Comfortable styling allows free and easy arm movement. Doesn't bind or constrict . . . Slipover design and adjustable grip-buckle side strap keep jacket securely in place. Completely washable and dry-cleanable.

GENERAL TEXTILE MILLS, INC.
450 SEVENTH AVENUE, NEW YORK 1, N. Y.

good electrical insulation, ease of fabrication, lustrous finish.

Uses—Frames for eyeglasses, irrigation pipe, display packaging, rayon and acetate textiles.

Coumarone—Indene and Petroleum Resins

Resistance to water and caustic cleaners, compatibility with compounding ingredients, glass.

Uses—Asphalt floor tiles, waterproof coatings, aluminum paints, printing inks.

Epoxies

Excellent adhesion, resistance to chemicals and heat, can be cured at room temperatures.

Uses—Adhesives, surface coatings, transformer and motor laminates, printed circuit backing.

Fluorocarbons

Extreme resistance to solvents and corrosive agents, high impact strength, wide temperature range.

Uses—Chemical tubing, high temperature insulation, pump diaphragms.

Nylon

Good strength and toughness over wide temperature range, wear resistance, self-lubricating.

Uses—Gears, rope, brush bristles, slide fasteners, combs, nylon textile.

Phenolic and other tar acid resins

Hard and rigid, good electrical insulation, low water absorption, good temperature range.

Uses—Protective hats, goggle frames, grinding wheels, plywood, telephone handsets, radio-TV cabinets, shell molding, dials.

Polyethylene

Inert to solvents, flexible and tough over wide temperature range, nontoxic, odorless, tasteless.

Uses—Coaxial cables, semi-rigid kitchenware, squeezable bottles, packaging.

Polyester Resins

Weather-resistant, strong, formable with low pressure, compatible with many fillers.

Uses—Reinforced plastics for auto bodies, boats, translucent panels, Dacron textiles.

Silicones

Extreme heat resistance, good dielectric properties over wide frequency range, low water absorption.

Uses—Insulation for generator coils, circuit breakers, waterproof coatings, auto polishes.

Styrene Resins

Lightest of commercial plastics, excellent moldability, tasteless, odorless, unlimited color range.

Uses—Lighting fixtures, wall tiles, refrigerator parts, kitchenware, toys and novelties.

Vinyl Resins

Tough and strong, excellent electrical insulation, resistance to chemicals, oil and weathering.

Uses—Floor tile, protective garments for a wide range of exposures, metal and fabric coatings, rainwear, pipe and pipe fittings, valves, electrical insulation, machine and structural parts.

Note: Data presented in this table were obtained largely from The B. F. Goodrich Co. and Bakelite Corp. The number of applications of these plastic materials could, of course, be expanded considerably.

Falls Kill

—*From page 7*

—Lack of good lighting.

—Poor plant layout, overcrowding.

Poor Housekeeping

—Grease, oil or water on floors or steps.

—Loose or fixed objects on floors or steps.

—Loose material that may shift underfoot.

—Icy walks and steps.

Personal Causes

—Carrying too heavy or bulky loads.

—Failure to use personal protective equipment (e.g. safety belts).

—Physical impairment.

—Haste, inattention, chance-taking, horseplay.

A high degree of safety from falls can be built into the plant. Many hazards can be avoided if plans for construction and alteration projects are reviewed by the safety department.

Nonskid floors and general safety features in stairs, elevators, platforms, fixed ladders, ramps and other locations can be specified. With permanent installations designed for safety, more attention can be given to maintenance and training.

Work above the ground level is not without hazard even when normal precautions are taken, but the risk can be minimized when ladders are the right type for the job, well maintained and properly used. Ladders conforming to the ASA code are reliable. Then set up a maintenance program to keep them in safe condition.

Scaffolds are temporary structures and sometimes leave something to be desired in materials and workmanship, particularly for small jobs. When used frequently, portable sectional metal scaffolds can be a good investment.

There are several types of flooring with good anti-slip qualities.

—*To page 167*

TOUGHER!

The *one* Neoprene Cork Sole that does *not* compromise wear for weight!

BILTRITE SAF-T-STEP NEOPRENE CORK SOLES

Expressly compounded to meet both the *demand* for lighter weight and the *need* for longer wear.

- *Resist oil, grease, chemicals and acids*
- *Resilient, flexible, long wearing*
- *Special high grade lighter weight compound*
- *Styled for modern industrial use*

Biltrite Industrial Soles also available in

Super-Lite Cork

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FOR LINEMEN AND OTHER HIGH VOLTAGE WORKERS

INTERLOCKING LINE HOSE

Completely surrounds the wire with a thick wall of rubber having high dielectric strength. Locks itself in place but is easy to apply or remove.

Sizes: ⅝", 1", 1¼", 1½" inside diameter.

Lengths: 3', 4½', 6'.

RUBBER INSULATOR HOODS

Used in conjunction with Line Hose to cover conductors as they pass over insulators. Inward extending flanges prevent accidental dislodgement. Compact construction. Convenient to handle.

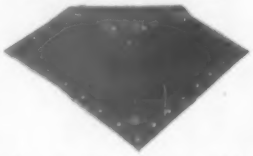
CONNECTOR-END LINE HOSE

Standard Line Hose with built-on connector-end for joining to additional lengths or for covering enlarged wire taps, leads on stud type transformers, etc. Sizes same as standard line hose.

LINEMEN'S RUBBER BLANKETS

Indispensable for covering odd shaped equipment. Made of best grade rubber with long-life and high dielectric qualities. Sizes 36"x36" and 36"x27". Also available with "Snap-Button" and eyelets.

SNAP-BUTTON RUBBER JACKETS



Highest quality small size rubber blanket, 22"x22", equipped with Salisbury hard rubber button fasteners and used to cover dead ends or other similar hazards that require securely fastened protection.

LINEMEN'S TOOL BAGS

Non-metallic canvas bags properly shaped and constructed for safety in raising heavy tools and supplies to men on poles or other elevated places. Sizes 8"x 14" or 12"x16" for tools and 7"x48" for line hose.

LINEMEN'S RUBBER SLEEVES

Protect the arms and shoulders from accidental contact with "hot" equipment. Held in place by adjustable rubber strap across the shoulders. Made in chromium plated molds to insure high voltage resistance, smooth surface and long life. Regular and extra large sizes.

NON-SPILLABLE P. B. COMPOUND POTS

Provide a safe and convenient means to carry insulating paint and brush. Being made of semi-hard synthetic rubber, they are non-conducting, non-breakable and are unaffected by the usual P. B. compound used.

LINEMEN'S GLOVE BAGS

Necessary for glove protection in storage and transportation and useful, when properly labeled, for personal identification. Made of heavy waterproof duck, sturdy and durable. Snap hook and "D" ring attached. Size 8" wide, 15" long.

LINEMEN'S RUBBER GLOVES

Best grade steam-cured gloves, carefully made to meet all standard specifications. Furnished in curved or straight finger style. Standard gloves are rated at 10,000 volts, 14"-18" lgths.; 18" lgths.; 15,000 or 20,000 volt gloves are available. All sizes and half sizes from 9 to 12.

RUBBERCUFF PROTECTOR GLOVES

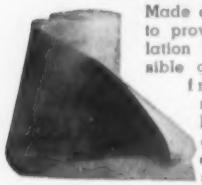
Similar to our standard all-leather protector glove with the addition of a full-length molded rubber cuff. Rubber cuffs do not increase current creepage to the forearm. They prevent costly snags in gauntlets of linemen's rubber gloves which are required to extend beyond ordinary leather protectors. Furnished in several sizes to fit perfectly over rubber gloves.

ALL-LEATHER PROTECTOR GLOVES

Worn over rubber gloves to protect them from injury. Made of specially tanned Grade "A" buffed horsehide and carefully designed to fit perfectly over rubber gloves. Soft and pliable under all conditions. Do not become slippery when wet. Band-top or gauntlet styles. All sizes.

A DEVICE FOR EVERY ELECTRICAL HAZARD

SWITCHBOARD MATTING



Made especially to provide insulation from possible ground in front of switchboards or other electrical equipment. Rated at 40,000 volts and meets the A. S. T. M. specifications. Widths 24", 30", 36", 48". Any length.

MISCELLANEOUS EQUIPMENT

Static Resisting Rain Coats
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Industrial Rubber Rain Coats
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Elbow Length Sleeves
Slotted Side Blankets
All-Rubber Cable Bandages
Blanket Canisters
Blanket Clamp Pins
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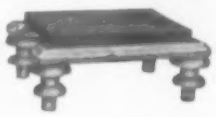
ELECTRICIAN'S INSULATING STOOLS



Designed to provide a safe, low platform for men with hazardous tasks in substations, underground vaults and power plants. Size 18" x 12" x 8" high. Guaranteed.

These materials are satisfactory for platforms, walkways and ramps, and around machinery.

In many places non-skid coatings may be used. Pressure sensitive fabric with abrasive surface also has numerous uses. It is easy to apply and wears well.

For a sure footing, footwear is important. Shoes should be kept in good repair. Soles and heels of rubber or neoprene with cord or granules of cork incorporated will grip most surfaces.

Good housekeeping is one of the most important preventives of falls. In meat packing plants and some other food processing industries cleaning up the floors must go on constantly or neither the floor surface nor anti-slip soles and heels will be effective.

Where conditions warrant, use absorbents to remove oil and grease from floors, particularly in machine shops and garages.

Where floors must be waxed for protection or appearance, a coating with high resistance to slipping should be used. * * *

The Safe Plant

—From page 18

ployees reach their jobs through passages below the main production floor.

Where traffic is heavy and many employees must be handled, an underpass or overpass will help remove congestion, delay and hazard.

Parking. The parking lot cannot be overlooked in plans. If to reach it a busy thoroughfare must be crossed, an underpass or bridge may be needed. The lot should have separate entrances and exits.

Lighting at night helps to prevent accidents and theft.

Traffic and directional signs aid in proper use of the parking area.

Controlled conditions. Modern lighting and air conditioning no longer make industry dependent on nature for light and climate. Whether to build a windowless plant or one of conventional design is primarily a problem of economics. Safe, healthful and comfortable working conditions can be provided in either type building.

One-story plants are preferred in locations where land values are not excessive and plenty of room for expansion exists. Advantages claimed for one-story construction are:

—Lower construction costs
—Freedom from stairs and elevators
—Ease in routing and handling bulky and heavy equipment
—Better light and ventilation
—Ease in isolating hazardous processes
—Efficient handling of material
—Ease of supervision
—Lower operating and maintenance costs
—Possibilities for attractive landscaping and architecture

Roofs. Flat roofs or those with few projections are comparatively low in cost. Monitor and sawtooth roofs are becoming less popular although they are effective in admitting light and air to the center

Ebony garments for the dirty jobs

THEY WITHSTAND REPEATED LAUNDERING

When a man works in dirt, mud or just plain "gunk," he needs garments that can take rough abuse. Yet, despite rugged on the job wear, garments take their **worst beating in the laundry!** Often, prolonged rough and tumble action plus strong laundering chemicals are needed to get garments clean. Clothing must take that punishment time after time and still come back for more.

Ebony garments are specifically designed for those dirty jobs. Ebony is a "cousin" of Gra-Lite, a widely known garment material for maximum protection against corrosive chemicals. Enough of that chemical resistance was built into Ebony clothing to enable Ebony to stand up under repeated launderings. Ebony takes the beating on the job **and** in the laundry, far outlasting ordinary garments.

Find out how Ebony fits into your protective clothing picture. Write today for information and prices.

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Do you have a "Pet" Idea?

We will immediately design or duplicate any belt in any quantity to your exact needs.

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Submit your sketches and specs to:

INDUSTRIAL SAFETY BELT CORPORATION

568 S. AIKEN AVE.
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of the building. With modern light sources rivaling natural light, daylight has become less important.

Materials Handling

Materials are moved in and out of the plant by highway, railroad, water and sometimes air. More than two of these methods seldom are needed.

Loading docks should be planned for traffic both outside and within the plant.

Studies of the flow of materials through a plant—from their receipt, through processing, until they are shipped out as finished products—often reveal ways to reduce handling operations as well as hazards.

Adequate clearances between vehicles and fixed structures must be provided. This is particularly important in plant railways and driveways.

Waste material must be removed constantly. Junk accumulates when efficient removal facilities aren't provided.

Machine Layout

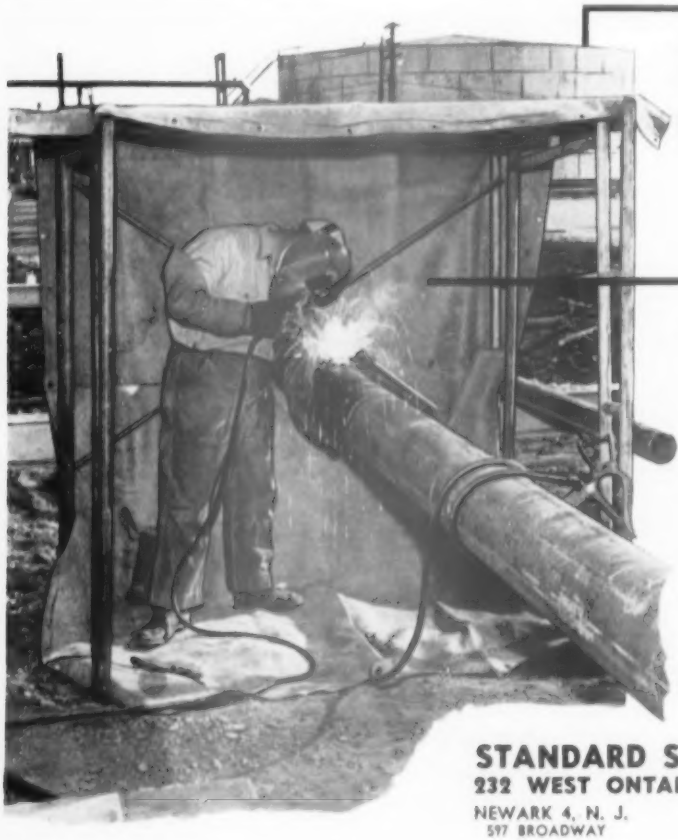
The work station. Insufficient space is a common cause of accidents. Each operator should be able to sit at, stand at, and move safely about his machine, bench, desk or other equipment.

He must be able to get into that space without slipping, bumping objects, striking overhead objects, or coming into contact with live electrical parts or moving parts of machinery.

He must have room to move material being processed. He must have space for hoists, lifts, or hand or power trucks.

In continuous line operation where machines are served by conveyors, little or no intermediate storage space for materials is necessary. In other types of operation, added space for storage of raw and finished materials is essential.

Insufficient headroom is a hazard. "Temporary" installations of pipelines, equipment supports, overhead conveyors and other in-



TARPS THAT TAKE A DRENCHING IN SPARKS

...and go right on protecting

This photo shows a STA-SAFE Tarp at work in a large oil refinery where the constant threat of fire demands positive protection. Even after long use on outdoor welding jobs, and repeated exposure to oil, this STASAFE Tarp still gives the superior safety required. The weather has no effect on its flame resistance and oil, dirt and greases wash right off!

Regardless of the application, STA-SAFE Welding Tarps never lose their fire resistance. They last longer, cut your replacement costs to an absolute minimum.

For more information, write today for your bulletin *StaSafe Welding Tarps*

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stallations that might cause head bumps often can be avoided. Elevation drawings should be studied to determine location of potentially troublesome equipment.

Vertical clearance of at least 7 ft. should be provided, especially over aisles, passageways and stairways. Where this is not practicable, overhead obstructions should be padded or marked by contrasting paint.

Storage space must be adequate to avoid confusion, bad housekeeping, fire hazards, overloaded floors and damaged stock.

Supplies, tools, safety equipment, small parts and equipment not used regularly should be stored in convenient locations.

Maintenance is facilitated when such items as personal protective equipment, ladders and hoisting equipment are readily available.

Safe access to all parts of the plant should be provided.

—Stairways are first choice where conditions permit.

—Fixed ladders may be used where space is limited.

—Portable ladders are acceptable where need for access is relatively infrequent.

Stairs for general use should be convenient to areas served, have standard handrails and be free from obstructions at top or bottom.

In-plant Traffic

Planning for the movement of power trucks, hand trucks and tractors in and about buildings requires provision for adequate clearance in aisles, corridors and passageways, and at corners and curves.

Aisles, particularly main traffic aisles, should be of generous width, straight as possible and free from obstructions. Where possible, corners should be cut off on a diagonal and visibility unobscured.

If vehicles must pass, the aisle should be at least twice the width of the widest part of the vehicle or load, plus another 3 ft. if the aisle is used by pedestrians.

If traffic is not heavy, the aisle can be of a width equal to the

LOOK TO STEEL-GRIP FOR BETTER PROTECTION AT LOWEST COST

JAXCOLITE

Amazing new compound makes asbestos, duck and burlap garments extremely resistant to heat, molten metal splash, acids, caustics, oil and water. Long wearing and low cost. Users won't buy anything else. Nothing to compare with it. Available in coats, pants, aprons, sleeves, leggings, spats, hoods, etc.

HEAT REPELLENT ALUMINIZED ASBESTOS

Aluminized surface reflects up to 95% radiant heat. Asbestos body resists fire. Result is cool safe protection. Available in all body protection garments.

SPRING-TYPE LEGGINGS, AND APRONS

Spring-type Leggings made of chrome leather, flameproof duck or asbestos. Easy to put on and off. Air-pocket lining for comfort. Special close-fit collar. Tuck-in flaps protect back of legs. Many types of aprons available in all materials and styles. Tell us what you want.

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A Steel-Grip "first". Steel-Grip has own laboratory, tests all its raw materials. Our tests show following specifications give longest wear, greatest strength: Minimum of 83% asbestos, maximum of 17% long fiber cotton content. 20 warp ends per inch, 10 woof ends per inch. Minimum weight 2.47 lbs. per yard. Warp tensile strength min. 145 lbs. Woof tensile strength min. 65 lbs. Every Steel-Grip asbestos safeguard certified to you to meet or beat these specifications. Your guarantee. Demand this certified label. Coats, pants, gloves, mitts, etc.

Steel-Grip offers a complete line of safety apparel for every industrial need. Note especially the Steel-Grip designs in new materials extremely resistant to heat, molten metal splash, acids, caustics, abrasion and wear. Since 1910, quality manufacture from selected materials has been our standard practice. We offer correctly designed safeguards, in leather, duck, Perma-Proof materials, asbestos, wool, Dynel cloth, Jaxcolite-coated materials, aluminum-coated materials, etc. They give long wear, uniform dependability at the lowest man-hour costs . . . the real measure of value. Don't buy on appearances or first price. Buy safeguards like you would buy machines . . . on performance. Buy tested and proved Steel-Grip safeguards and watch your costs go down. Write today for complete catalog.

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(In Canada: Safety Supply Co., Toronto)

Steel-Grip INDUSTRIAL Safety Apparel
TRADE-MARK

To be sure of the Genuine Demand this Trade Mark.

STEEL-REINFORCED LEATHER GLOVES AND MITTS

Finest quality chrome-tanned leather, in varying weights with varying degrees and styles of steel reinforcement, according to the conditions of the job. Afford the utmost in wear and abrasion resistance.

maximum width of the vehicle or load plus 2 ft., provided passing zones are established at intervals of from 150-200 ft. One-way traffic aisles are becoming increasingly popular.

Aisles should be marked by colored lines—safety orange or white. Permanent markers, such as metal disks, also are suitable. Floors should be kept clean and defect-free.

Aisles should be well lighted. If not lighted at night by general lighting, night lights should be provided for the benefit of service employees or off-shift workers. Emergency passageways should be marked by standard exit markers.

Cross aisles should be avoided at tops and bottoms of ramps. If possible, aisle and ramps should be in a straight line.

Pedestrian traffic. Aisles should be proportionately wider to accommodate rush traffic to time clocks, lunchrooms and exit gates. Main aisles up to 20 ft. wide and cross aisles not less than 8 ft. wide are desirable.

Where foot traffic parallels railways or other fixed track carriers, adequate clearance should be provided to allow the aisle edge to be marked by a conspicuous line on the floor.

Gates, warning signals or signs and barricades should be provided. Where traffic is heavy, underpasses or bridges for both vehicular and pedestrian traffic should be considered.***

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Safety Clothing and Equipment

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ARMORLITE V/G – vinyl impregnated glass cloth

ARMORLITE V/N – Double coated vinyl nylon

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Planned Lighting

—From page 52

Weather-resistant lamps are used for outdoor lighting in industrial plants, docks, athletic arenas, etc. They stand exposure to rain, sleet and snow without cracking.

Explosion-resistant fixtures are used where dusts, gases, fumes and vapors may create a hazardous atmosphere.

Infrared lamps, available in types and sizes up to 1,000 watts, are used for baking, drying and heating processes, as well as for therapeutic use.

Maintenance

Efficient lighting requires a systematic maintenance program. Equipment may meet all requirements when installed but dust and grime immediately start reducing light output.

The first step in a maintenance schedule is to check illumination periodically with a light meter. When light has decreased to 75 per cent of its original value, lamps and reflectors should be washed with warm water and a detergent containing no free alkali.

Group replacement of lamps, both filament and fluorescent, is often practicable and desirable. The saving in cost of replacing a large number of lamps at one time is greater than the value of the remaining light output of the lamps. Point of replacement is usually 60 to 80 per cent of the rated lamp life.

Disconnecting hangers permit lowering fixtures to the ground or floor for cleaning, relamping and repairs. Much climbing is eliminated.

Outdoor Lighting

Outdoor lighting for night work or to detect trespassers is required by most industrial plants. Where work is done outdoors after dark, levels must be higher than those needed chiefly for plant guards to spot intruders and detect unusual activities and conditions.

Light sources should be shielded and aimed so that the area can be seen clearly. Light can be directed to form a "glare barrage" in the direction from which intruders might approach the plant.

Emergency Lighting

Where power failure would endanger life, an emergency lighting system should be provided. It should be independent of the general lighting system. Exit, corridor, platform, wharf, and other locations should be included in the system so that persons could find their way out of a building.

Approved automatic devices should be installed to transfer the lighting load from general to emergency circuits in case of trouble.

Portable systems. For such emergencies as fire, explosion, accidents, or mobs, portable emergency lighting is needed. Portable wide and narrow beam floodlights with long extension cords will be helpful in rescue work and maintaining order. For use far from power sources, a power unit mounted on a truck is needed.

Standards

Lighting fixtures differ greatly in quality of materials, workmanship and lighting efficiency. To protect the buyer, the RLM Standards Institute provides nationally recognized minimum standards of quality in lighting equipment. Equipment bearing the RLM label meets the institute's requirements. * * *

Learn from other people's mistakes; you can't make them all yourself.

You can cut your GLOVE COSTS

with the authorized

JOMAC COST-REDUCTION PLAN

send for free booklet

It contains dollars-and-cents proof that glove costs can be reduced. Write today to Jomac Inc., Dept. D, Phila. 38, Pa., and ask for "Evidence" booklet.

JOMAC INDUSTRIAL GLOVES

Plants in Philadelphia, Pa., and Warsaw, Ind.
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SAFETY SHOES PLUS!

Safety Engineers agree that a good fit in Safety Shoes means the difference between good work and inefficiency. Safety shoes fitted by the Brannock Scientific Foot-Fitting System not only assure foot comfort and more efficient workmen... but promote the sale of safety shoes through satisfaction. For information on the Brannock Device write today to...

THE BRANNOCK DEVICE CO.
Syracuse 3, New York

Plan Work Furniture For The Individual

WELL-DESIGNED work furniture permits efficient work without unnecessary fatigue. Work surfaces should be of correct height. Chairs should be adjusted to the needs of the individual.

Alternate periods of sitting and standing at work reduce fatigue. If this is not practicable, furniture should be planned for maximum comfort and efficiency.

Work surfaces. Height of benches, machines, tables and assembly lines is determined by whether the workers sit or stand. Another factor is whether hands or eyes are more important to the operation.

Tilted or recessed tables facilitate some types of work.

Seating. Height relationship between seat and work is important. Workers differ quite widely in height and proportions and seat height should be adjusted accordingly.

A factory chair should be:

—Comfortable
—Safe
—Easily adjustable
—Economical to maintain

A chair should provide back support. Without it the worker uses much energy just sitting erect. The back rest supports the back between the lower ribs and the hips.

A deep form-fitting seat, of the tractor, bucket, or western saddle type, is better than one that is flat or slightly curved. The seat should not touch the tendons and blood vessels on the back of the leg just above the knee.

Too soft a seat is not desirable. Contour is more important than padding.

Edges and corners should be rounded to avoid damage to clothing or injury to persons.

Foot rungs shorter than the foot spread of the chair lessens pos-

Bashlin's *Linemen's Choice* **SAFETY EQUIPMENT**

Semi floating, Shifting "D" Safety Belt with nylon Safety Feature
Industrial Web Safety Harness
Adjustable and Standard Climbers Steel or Aluminum
Electricians' Tool Belt with or without Holster
Double Axe Guard Fibre, Wood Bottom
Leather Safety Straps 24 Styles
Shifting "D" Safety Tool Belt with Built-in Nylon Safety Feature
Leather or Fibre Pruning-Saw Guard
Canvas Tool Bucket—Non Metallic Fibre Top —Leather Bottom
Linemen's Leather Tool Holsters
Write for Catalog '56
BASHLIN'S

W. M. BASHLIN COMPANY
GROVE CITY 3, PA.

sibility of tipping, particularly on the higher chairs.

A posture chair must be adjusted to the individual's need or most of its benefits will be lost. The user should also be taught to sit properly.

Aging Eyes Need More Light

ORGANIZATIONS with many middle-aged employees might be wise to study their lighting systems.

That's the advice of lighting researchers at General Electric Company's Lamp Division, Nela Park, Cleveland, Ohio. More light is needed for workers over 45, as well as for young employees, the researchers report.

Most tasks, said Sylvester K. Kuth, research team director, are dependent on visual abilities of workers; and as workers get older their need for higher footcandle levels increases.

And since statistics indicate that the average age of the working population is increasing, adequate lighting must be provided. United States 1950 census figures show that between 1940-50, the number of workers between 45-64 increased 3 per cent to 32 per cent. Figures for the 35-64 age group—which includes more than half the working force of the U. S.—increased during the 10 years to 56.7 per cent.

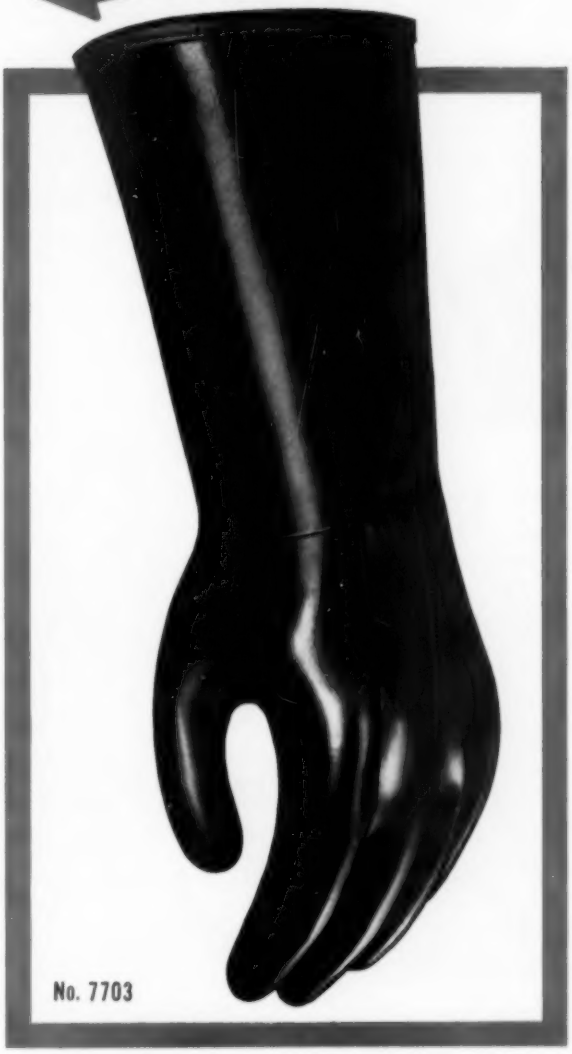
Tests showed that, to see as well as workers in the 17-24 age group, older employees need nearly twice as much light. Till a person is 45, his decrease in visibility is gradual, but after that, becomes more pronounced.

The oldest groups attain a visibility level of about 7 with 80 footcandles, while the youngest groups reach an equal level with 50 footcandles. To achieve an equal visibility level of 5, which the youngest group reaches with 30 footcandles, oldsters need 58 footcandles.

Obviously, it usually will be uneconomical to provide individualized lighting for workers. But everyone will benefit from higher footcandle levels, and workers' low visual ability can be raised to a more reasonable level.

Exclusive Design for extra safety

HOOD GAUNTLET



This all-purpose neoprene-coated industrial gauntlet has reinforced 6" cuff *with anti-rip binding* for complete forearm protection. Fully curved fingers for proper fit and flexibility. No bunching on palm —no binding on back. *Reinforced thumb crotch* for extra wear. Industrial weight, 14½" over-all.

Write today for free Hood Glove Guide—shows you how to choose the RIGHT glove for EACH job.

HOOD RUBBER CO.,
a division of the B. F. Goodrich Company
WATERTOWN, MASS.

RUBBER • NEOPRENE • PLASTIC COATED INDUSTRIAL GLOVES

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Scott Safety Breathing Equipment

IS THE BEST FOR YOU?

Scott Air-Pak Model 6000-B4A

This is the "Sling-Pak" model especially recommended for fast emergency work where seconds count. Complete unit weighs only 19½ pounds. Tank holds 22 cubic feet of cool fresh air — enough to protect the wearer for at least 15 minutes at extreme exertion. Offers complete breathing protection at lowest cost.

Scott Air-Pak Model 6000-A2M

The "Back-Pak" model carries the air cylinder on a comfortably shaped aluminum back plate. Complete weight approximately 29 pounds. Will give breathing protection at extreme exertion for a minimum of 30 minutes.

Scott Extension Model 6000-C6

Permits safe, comfortable breathing for any number of workers at any distance from supply cylinder. Recommended for operations of 5 to 8 hours at extreme exertion. 6000-C5 same but with reserve air supply egress bottle.

VISIBILITY UNLIMITED with the incomparable SCOTTORAMIC Mask

All Scott Air-Paks can be supplied with the new Scottoramic Mask that affords unlimited vision in all directions. It enables the wearer to spot danger zones quickly for added safety.

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Canada: Safety Supply Co., Toronto — Branches in principal cities
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Steel Veterans Recall Early Protection

TODAY'S STEEL MILL is safer than the average home.

And the trail for present-day equipment which helps maintain such an enviable record was blazed by old-fashioned safety gear, some of which created minor hazards itself.

So reported *The Keystone*, magazine of Pittsburgh Steel Company, in a recent issue.

Here in essence is the magazine's report:

A good example (of old-fashioned safety gear paving the way for today's efficient equipment) is safety shoes—probably the first piece of standard equipment to go beyond the makeshift, do-it-yourself gear used in the steel industry before World War I.

The old-style, high-topped safety shoes weighed about 7-8 pounds —nearly twice as much as a pair today. They were designed to protect a man's foot from falling objects—and did. But other features of a normal shoe were sacrificed for this protection.

Metal, inserted in the toe, was a simple wedge marked at the edge by a straight cut. Almost all veteran steelmen remember those shoes.

Take Eugenio Gaudio, blast furnace transfer car operator, for example. He remembers buying his first pair of safety shoes soon after joining Pittsburgh Steel in 1916. In fact, he bought two pairs. The first pair wore out in three weeks.

"The metal in the toe pressed on your instep," he recalled. "You'd go home at night with tired feet. But despite their disadvantages, we liked the shoes. They offered more protection than anything we could think of and we were glad to be able to get them."

Now, three elements are built into safety shoes: protection, comfort and style. Shoe design has advanced so rapidly that workers in a mill today can't tell a safety oxford from a regular low-cut shoe.

Safety shoes also are available at cost in heavy-duty boot form and the popular athletic type.

Designers of safety equipment keep the performance of the shoe in mind when developing ideas

for new equipment. Protection and comfort are essential. If style can be worked into the product, so much the better.

Big strides have been made with safety glasses since the goggles were introduced. Heavy objects, they had a built-in disadvantage: Side portions often stopped a man from seeing out of the corner of his eye.

Now, lightweight safety glasses are supplied by the company. Not only do they give more protection than the old goggles, but they look as good as the spectacles you get from your optician.

Face masks, hoods and shields will never upset the fashion world. But neither can the fashion world challenge the protection they offer. And new ways to make such equipment more comfortable are being devised.

Terry McGovern of Monessen recalls the masks in use when he joined the company in 1922.

"When we worked on the old crucible furnaces, we probably had one of the most uncomfortable pieces of safety equipment you could imagine. It was a wooden mask with square eye slits. There was a wedge on the back of this mask and you held it in place by biting on the wedge.

"The smoke from those old furnaces was so thick you couldn't see more than two furnaces away. It was pretty uncomfortable hanging onto the mask in all that smoke."

John Dzurinko recalls the days when blast furnace workers wrapped burlap bags around their legs to protect them from the heat. Workers frequently dipped the bags in cold water to increase protection.

Now, the average blast furnace hot blastman has about $56 of company-supplied safety equipment when he starts a cast on its way. This equipment includes heat veil, asbestos coat, chrome-leather leggings and protective gloves.

Pipe-coverers Frank D'Astolfo and Joe DeRocco now use goggles, hard hats and respirators on their jobs. But when they started with the company they, like their co-workers, were do-it-yourselfers.

Joe laughed when he described what he looked like working on some of those earlier jobs.

"We tied handkerchiefs over our mouths, then pulled our coats up over our heads and pulled a hat on top of the coat. That was the only way we could lower the chance of hurting our heads and still get protection from the steam."

Nobody appreciates the improvements in personal protection more than the old timers who remember the days when they had to wear crude, cumbersome equipment—or none. They believe all employees should take advantage of the protection provided by the company.

A man's condition is best judged by what he takes two at a time—stairs or pills.

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COMING EVENTS

in the safety field

Mar. 3-5, Richmond, Va.

Southern Safety Conference and Exposition (John Marshall Hotel). W. L. Groth, executive director, Southern Safety Conference, Inc., P. O. Box 8927, Richmond, Va.

Mar. 13-14, Philadelphia

Twenty-third Annual Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, manager, Philadelphia Safety Council, c/o The Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia.

Mar. 18-22, New York

Twenty-seventh Annual Greater New York Safety Convention and Exposition (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 E. 42nd St., New York 17.

Mar. 18-19, Boston

Thirty-sixth Annual Massachusetts Safety Conference (Hotel Statler). Bert R. Harmon, director of activities and information, Massachusetts Safety Council, 31 State St., Boston 9.

Mar. 18-20, Los Angeles

Fourth Annual Safety Congress and Exhibit (Ambassador Hotel). Joseph M. Kaplan, manager, Greater Los Angeles Chapter, National Safety Council, 3388 W. Eighth St., Los Angeles 5.

Mar. 19-20, Fort Wayne, Ind.

Northeastern Indiana Safety Conference and Exposition. Ivan A. Martin, manager, Safety Council, Chamber of Commerce, Fort Wayne, Ind.

Mar. 25-27, Houston, Tex.

Eighteenth Annual Texas Safety Conference and Governor's Highway Safety Conference (Rice Hotel). J. O. Musick, general manager, Texas Safety Association, 830 Littlefield Bldg., Austin, Tex.

Apr. 2-4, Pittsburgh, Pa.

Annual Engineering Conference (Penn-Sheraton Hotel). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, 605 Park Bldg., Pittsburgh 22, Pa.

Apr. 3-4, Indianapolis, Ind.

Tenth Central Indiana Safety Conference and Exhibit (Claypool Hotel). Jack E. Gunnell, director, Indianapolis Safety Council, Indianapolis Chamber of Commerce, 320 N. Meridian St., Indianapolis 11, Ind.

Apr. 3-5, Gainesville, Fla.

Fourth Annual Conference on Accident Prevention (University of Florida). Donald B. Wilcox, conference coordinator, College of Engineering, University of Florida, Gainesville, Fla.

Apr. 8-9, Stockton, Calif.

First Annual Central California Safety Conference and Exhibits. Raymond A. Norwood, executive secretary, San Joaquin County Safety Council, Inc., City Hall, Stockton 2, Calif.

Apr. 8-9, Toronto, Ont.

Industrial Accident Prevention Association's Annual Convention (Royal York Hotel). R. G. D. Anderson, general manager, IAPA, 90 Harbour St., Toronto 1, Ont.

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Apr. 9-11, Columbus, Ohio
The 27th All Ohio Safety Congress and Exhibit (Deshler Hilton Hotel). A. W. Moon, congress manager, Room 611, Ohio Departments Bldg., Columbus 15, Ohio.

Apr. 11-12, Kansas City, Mo.
Central States Safety Congress (Hotel President). George M. Burns, director, Kansas City Safety Council, 419 Dwight Bldg., Kansas City 5, Mo.

Apr. 23-25, Grand Rapids, Mich.
Twenty-seventh Annual Michigan Safety Conference (Pantlind Hotel and Civic Auditorium). Norb Hildebrand, Highway Traffic Safety Center, Michigan State University, East Lansing, Mich.

Apr. 25, La Crosse, Wis.
Southwest Wisconsin Regional Safety Conference, Oscar Wallschlaeger, Electric Auto-Lite Co., La Crosse, Wis.

Apr. 29-May 1, Syracuse, N. Y.
Fifth Biennial Central New York Safety Conference and Exposition (Hotel Syracuse). Newell C. Townsend, administrative secretary, 351 S. Warren St., Syracuse 2, N. Y.

May 6-8, Allentown, Bethlehem, Easton, Pa.
Thirtieth Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, secretary-treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

May 8-9, Niagara Falls, N. Y.
Seventeenth Western New York Safety Conference, in cooperation with the American Society of Safety Engineers (Niagara Hotel). Patsy E. Gismondi, executive secretary, 1436 Delaware Ave., Buffalo 9, N. Y.

May 9-10, Baltimore, Md.
Annual Governor's Safety-Health Conference and Exhibit (Lord Baltimore Hotel). Joseph A. Haller, executive chairman, Safety Conference, Department of Labor and Industry, State of Maryland, 12 E. Mulberry St., Baltimore 2, Md.

May 9-11, Winston-Salem, N. C.
Twenty-seventh Annual North Carolina State-wide Industrial Safety Conference (Robert E. Lee Hotel). H. S. Baucom, director of safety, North Carolina Industrial Commission, Raleigh, N. C.

May 15-16, Oklahoma City
Ninth Annual Oklahoma Safety Conference (Skirvin Hotel). Bob Eastman, manager, Oklahoma Safety Council, 1600 N. W. 23rd, Oklahoma City, 6.

May 16, Lake Delton, Wis.
Rock River Valley Safety Conference. Allen Paschen, Northern Engineering Co., Baraboo, Wis.

May 20-24, Los Angeles
Sixty-first Annual Meeting of the National Fire Protection Association (Hotel Statler). Percy Bugbee, general manager, NFPA, 60 Batterymarch St., Boston 10.

May 23, West Allis, Wis.
Southeast Lakeshore Safety Conference. Dick Lutz, Falk Corp., 3027 W. Canal St., Milwaukee 8.

May 23-24, Duluth, Minn.
Thirty-third Annual Conference of the Lake Superior Mines Safety Council (Hotel Duluth). Allen D. Look, secretary, 329 Federal Bldg., Duluth 2, Minn.

June 4-5, New Haven, Conn.
Twelfth Annual Connecticut Safety Society Conference (Jewish Center Bldg.). Dennis J. Hickey, manager, Waterbury Manufacturing Co., Waterbury, Conn.

June 6, Chippewa Falls, Wis.
Northwest Regional Safety Con-

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ference. C. R. Johnston, Cornell Paperboard Products Co., Cornell, Wis.

June 11, Stevens Point, Wis.
Wisconsin River Valley Safety Conference. Victor J. Bukolt, Lullabye Furniture Corp., Stevens Point, Wis.

June 13, Neenah-Menasha, Wis.
Fox River Valley and Lakeshore Safety Conference. Howard Aderhold, Marathon Corp., Menasha, Wis.

Sept. 12-13, York Harbor, Maine.
Thirtieth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, secretary, Department of Labor and Industry, State House, Augusta, Maine.

Sept. 17-19, Cleveland, Ohio
Nineteenth Annual Ohio State Safety Conference (Hotel Carter). H. G. J. Hayes, secretary-treasurer, Suite 514 - 2073 E. 9th St., Cleveland 15, Ohio.

Sept. 23-26, Montreal, Canada
Annual Meeting of the American Transit Association (Sheraton Mt. Royal Hotel). Arthur W. Baker, general secretary, 292 Madison Ave., New York 17.

Oct. 16-17, Chicago
Second Annual Sanitation Maintenance Show and Conference (Navy Pier). Orkin Expositions Management, 19 W. 44th St., New York 36.

Oct. 21-25, Chicago
Forty-fifth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Equipment for Handling Corrosive Chemicals

Acids, alkalis and other corrosives require a variety of specialized handling apparatus, and protective garments for employees. Devices include:

—Buckets
—Dippers
—Funnels
—Pitchers
—Pumps
—Carboy inclinators
—Bags of padded, impermeable, acid-resistant material for carrying bottles of corrosive liquids.

Materials used for equipment include rubber, neoprene, stainless steel and several types of plastics. Materials vary in their resistance to chemicals, but manufacturers can recommend equipment for specific uses.

When Molasses "Exploded"

"SLOW AS MOLASSES in January" is a familiar expression. But some Bostonians remember a January day nearly 40 years ago when molasses proved mighty as a steamroller.

This strange "explosion" was described in *Safety Information*, published by the Royal Liverpool Insurance Group.

A tank of molasses was located in a commercial part of Boston. Nearby were a firehouse, an elevated railroad, a playground and brick and frame buildings. The steel tank, 90 x 50 ft., had a capacity of 2,385,000 gallons. It was nearly full.

It was noon. Laborers in the neighborhood had knocked off for lunch. Firemen were playing cards, happy that they didn't have to be out in the cold.

Then it happened.

Without warning, the molasses tank opened along its seams. A wall of molasses 45 ft. high moved through the area, leaving destruction in its wake. Buildings were leveled; horses, wagons, automobiles and people were swept away. Supports of the elevate railroad buckled. The firehouse was demolished.

Rescuers counted 21 dead, more than 50 persons seriously injured. Insurance companies were to pay claims of hundreds of thousands of dollars.

There had been no explosion in the usual sense of the word, no fire. The tank had had insufficient strength for its load. Most tanks of that day were built originally for oil storage. Molasses, though, is about 1.4 times the weight of water. A tank built for oil storage should not have been filled much more than two thirds its height to maintain the same factor of safety as when filled with oil.

Nowadays, when tanks of this type are inspected, inspectors determine the thickness of the metal, as well as dimensions and types of joints. Attention is given, too, to substructure construction and adequate venting.

Definition: A problem is an opportunity in work clothes.

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In emergency this new FITE RITE ASBESTOS FIRE BLANKET is available instantly.

Stored in metal container, painted brilliantly red, and may be hung on the wall just like a fire extinguisher.

Blanket can be used to

- Smother clothing fire by wrapping around victim.
- Shield fleeing persons from flaming area.
- Beat out or smother flash fires.
- Cover machinery and material, protecting them from flying embers or sparks, or nearby welding.

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"SANKEY" IMPROVED FOOT GUARD

The metal shield (above) is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep against hazards from falling, rolling or flying objects, or from accidental tool blows.

- Absolute freedom of leg motion, utmost protection and comfort come with the leg-contour shaped "Sankey" fibre shin guard (right).
- Fibre knee-shin guard (right) provides flexible knee movement on jobs with both knee and shin hazards.

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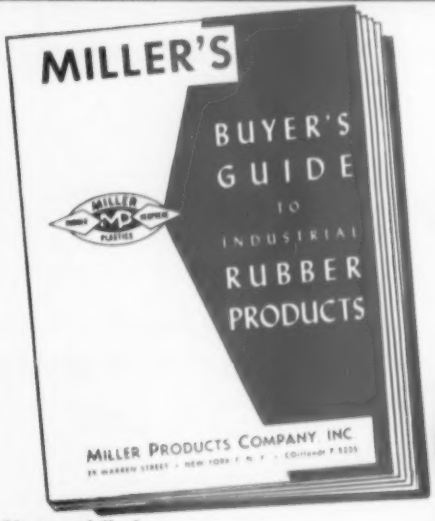

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Handling Glass

Handling glass is a job for experienced men. The glazier's safety problems are many, and injuries from glass can be severe. Opportunities for injury are found in:

—Lifting and carrying.
—Scaffolds.
—Grinding edges.
—Etching glass.
—Sandblasting glass.
—Warehousing and packaging.

Because injuries from glass can be severe, safe practices are more important in glass handling than in many other occupations.

Lifting and Carrying. Sharp edges and fragility of glass panes makes it necessary for the glazier to observe safe lifting and carrying rules.

Proper techniques in picking up and carrying glass should be used.

With a small, light pane that can be handled easily by one man, one hand should be held at the top edge to steady it, and the bottom edge should be held in the palm of the other hand—with the carrier's palm turned up and away.

Glass panes should never be carried under the arm. If one does, and falls, he could easily sever an artery or puncture a lung.

Small sheets of glass may be carried in one hand, the bottom edge held in the upward palm, the top edge resting on the arm or shoulder.

Both weight and size of the glass must be considered. If it's large, several persons may be required to handle even a lightweight sheet.

Rubber laps (mats) are commonly used for handling glass. Gloves are not recommended.

Big pieces should be lifted by grasping them at the side if possible—not from the bottom if that can be avoided; lifting from the bottom may cause back strain. For such pieces of glass, carrying straps should be used.

Any large glass pane should be handled by at least two men. They should be protected at the head, neck, and shoulders, by canvas sleeves and padding.

If glass panes must be carried more than a short distance, a truck crane should be used.

Anyone carrying glass, of course, should walk carefully and watch his footing.

In bad weather, especially in wind or rain, more men than usual will be needed.

On rainy days, the glass, and the rubber laps used in handling, should be completely dry.

Suction cups are used to handle glass where it would be awkward to handle it by the hands alone—or where one cannot get at it easily. There is one thing to guard against—if any dirt is in the cup or on the glass, there will be leakage of air, and suction cups will not hold.

A cause of serious injuries is the unsafe practice of tilting through a stack of panes to pick up a required piece. They should be moved over one by one, unless there is some safe mechanical means of preventing tilting or falling. * * *

Waterproof Covers

Waterproof covers often are needed to protect materials and equipment against water damage in case of fire. They are also useful for other emergencies, such as breaks in piping or when rain enters through broken windows or torn roofing during a windstorm.

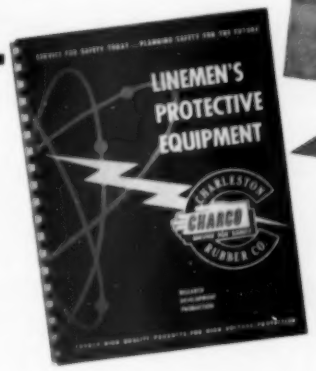
Waterproof covers are especially useful in buildings where machinery, equipment or stock is readily damaged by water. Such stock includes textiles, paper goods, hardware, foodstuffs, dry chemicals, leather goods, furniture, and other high-value materials. Areas in multistoried buildings where floor leakage is likely should have waterproof covers.

Approved covers of rubber-coated or chemically treated water-resistant canvas come in sizes up to 24 x 36 ft. They will last years if stored away from heat. They should be refolded regularly to prevent cracking along the folds.

Vinyl plastic sheeting is used for some purposes. These covers are nonconductors of electricity and transparent enough to see the work. They are used sometimes by public-utility companies for

ELECTRICAL PROTECTIVE EQUIPMENT

Charleston Rubber Company leads the field in manufacture of superior protective products for linemen and high voltage workers. Among CHARCO products are: high voltage and linemen's protective rubber gloves and sleeves, including FLEX-SAF Contour Cuff Gloves; "Bulldog" blanket and wire clamps; "Bulldog" utility flag clamp and danger flags; "Charcote" water repellent spray; CHARCO low voltage gloves; glove protectors and innerliners; canvas storage bags; flag standards and other products for safety.



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This new illustrated catalog, for use in public utility and industrial electrical fields, tells of the company's program of constant laboratory research and explains how CHARCO protective equipment is carefully manufactured and tested. It describes and illustrates many products and gives concise instructions on proper care and use. Also it lists valuable technical reports available free from the company, including the 18"x22" Glove Care Poster.

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	*Aprons		

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protecting linemen's repair work. They are also used for covering boats and trucks and for other specialized uses.

Watchmen and responsible plant employees should be instructed in prompt use of covers.

No Window Breakage With Plastic Glazing

PLASTIC GLAZING is saving the Pennsylvania Railroad $3,500 a year in replacement costs—and an additional amount for compensating personal injury claims—by eliminating breakage at just one trouble-point, the drop side-window in the motorman's cab of the suburban multiple-unit cars.

This 2 x 2½-ft. window had been especially vulnerable to breakage. To open the window, the motorman lowers it into a pocket about 30 inches deep. If he released it prematurely or if it slipped from his hand, the impact when the sash hit bottom almost invariably shattered the pane. Vibration and stresses on the pane, caused by warpage of the sash, also contributed their share of breakage.

At the Paoli (Pa.) Car Shop where the railroad's 463 multiple-unit and trailer cars are serviced, it is estimated that the breakage rate for these windows amounted to approximately 100 per cent annually on all drop windows.

Annual replacement cost ex-

PLEXIGLAS panes in all drop-windows in PRR's fleet of suburban multiple-unit cars has reduced breakage from nearly 100 per cent annually to nil.

ceeded $3,500 a year. This recurrent cost was accompanied by sizable secondary costs for personal injury claims from broken glass.

To eliminate breakage, the railroad embarked on a program of replacing broken windows with panes of ⅛-in.-thick Plexiglas, a shatter-resistant acrylic plastic, manufactured by Rohm & Haas Co. of Philadelphia. In the past year nearly every drop window in the fleet has been refitted with plastic glazing. Not one instance of breakage has occurred; no injury claims have been filed.

According to the supervision at Paoli, even though the acrylic glazing has more than repaid the initial installation costs by eliminating the recurrent breakage, the increased safety to motormen and others is itself sufficient justification for its use. Another advantage is weight reduction, which makes it easier to raise and lower the window. Also the plastic has sufficient resiliency to accommodate itself to bending and distortion caused by the occasional warping of sashes. In the case of glass such stresses reduce its ability to withstand shock and vibration.

Belt Conveyors For Passengers, Too

THE EFFICIENCY and economy of belt conveyors in bulk material handling is well known. Now, movement of passengers by the same method promises to be just as successful.

The Speedwalk passenger conveyor made its industrial debut at Weirton Steel Company, Weirton W. Va., where it conveys

workers from an operating floor to locker rooms 3½ floors above.

The plant employs more than 2,000 men in departments served by the Speedwalk, a system of four moving ramps.

Each unit moves upward at a speed of 132 fpm., half normal walking speed. The installation will, in 12 minutes, elevate more than 700 men some 41 feet.

The surface, a conveyor belt, is 24 in. wide and glides almost friction-free over a smooth steel deck, it is reported. As a safety measure, metal balustrades have been provided on both sides of the belt. Moving handrails are an added convenience.

Less costly than elevators or escalators, the Speedwalk has few moving parts and requires little maintenance. Electric motors of up to 15 hp power it. Motion is begun by push button or electric eye.

The device saves long climbs,

STYLE 608-23

WELDER'S SLEEVE

For arm protection from sparks, molten metal splashes, etc.

Chrome-tanned split cowhide with neck strap. 23½ inches long.

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Exclusive White Knee Boot. Ideal for dairies, food processors, ice cream manufacturers, chemical plants, meat packers, petroleum industries, etc.
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- Soft sponge inner sole
- Fully lined
- Heavy duty sole and heel
- Sizes 6 to 13

Black Knee Boot
Plain or Steel Toe. Fully lined. Soft sponge inner sole. Heavy duty heel and sole. Scientifically designed for wearer's complete protection and comfort.
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Exclusive—
Steel inner sole built in and safety toe to protect the wearer against injury from falling, and sharp objects. The steel inner sole is fully flexible and runs the entire length of boot. Will withstand 200 lbs. of pressure.
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SEE OUR GIANT WORK GLOVE LINE AT . . .
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Our nationwide distribution necessitates additional salesmen. Excellent earnings on commission basis by adding work gloves to your present lines. Only men currently calling on industrial plants need apply.

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23 W. PLEASANT • SPRINGFIELD, OHIO

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SURE GRIP SANDAL THAT PROTECTS THE FEET

(Comfort and safety on hot, cold or slick floors.)

Three quarters of an inch of tough Skidmaster belting between the soles of the shoes and the floor means comfort on hot, cold or wet floors and sure safety on slippery surfaces. Yet Skidmasters are about as flexible, lightweight and comfortable as an ordinary sandal.

Skidmasters are constructed for rugged, long-wearing, durable performance. Every part is of top quality material from the heavy gauge, copper coated steel wire binding cross treads to non-skid outer wall, down to the anchor rods for toe spring and ankle straps.

Brewery model Skidmaster has no exposed metal parts to come in contact with glass-lined tanks.

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These gloves are not ordinary work gloves, but are made from a patented process on soft, flexible leather, impregnated with insulating and refractory materials.

They have outworn ordinary work gloves six to eight times on many operations. Temperatures from 500 degrees F to 800 degrees F can be safely handled, depending upon the type of glove required.

Not only do they afford protection to the hands, but many hot materials can be handled without tongs or other equipment, thus saving both time and money.

If your dealer cannot supply you, we would be pleased to receive your inquiries.

LIBERTY PROTECTIVE LEATHERS, Inc.
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provides continuous transportation and keeps traffic moving orderly, its users report.

The passenger conveyor at Weirton was engineered, built and installed by Stephens-Adamson Manufacturing Company, Aurora, Ill.

Planning the Office

EFFICIENCY, convenience and safety require careful planning in office as well as factory. Essentials of a good working environment vary only in details with the nature of the operations.

Many of the principles of work flow apply to all workplaces.

Light, ventilation, washrooms and other employee services have an important influence on employee morale.

Housekeeping has values far beyond the appearance of the office and its influence on employees and visitors. It contributes to health and to the elimination of slipping and tripping hazards.

The following basic details should be considered:

1. Layout. Work should flow through the office with a minimum of backtracking.

Transportation distance of work should be at a minimum. Desks should be arranged so that each worker will receive his work from the person behind or beside him.

Heavy equipment should be placed against walls or columns.

Files should be placed against walls or railings.

Desks should face in the same direction for most office operations. Where two employees are working together, they may face each other.

Employees using the same machine should be grouped.

Employees should be placed in front of or around the persons having supervision over them.

Those having frequent callers should be near entrances.

2. Space. Growth of a business sometimes results in installing more desks and other equipment than original plans called for. Overcrowding is bad from the standpoints of appearance and psychological effect on employees,

and may overtax existing ventilation facilities.

A suggested minimum width for aisles is 4 ft. For desks facing in the same direction, distance between the back of one desk and the front of another should be not less than 3 ft. More space per employee is, of course, highly desirable.

3. Light. Fluorescent lighting fixtures with high efficiency and low current consumption, are making offices independent of daylight and permitting more efficient use of available space.

If offices depend largely on daylight, employees engaged in the visual tasks should be located near windows. North light is preferred by draftsmen and artists.

Employees should not face windows, unshielded lamps or other sources of glare. Walls and other surfaces should conserve light while avoiding annoying reflection.

4. Ventilation. In many offices window ventilation is unsatisfactory. Persons by windows may get cold and those farther away may be warm. Where there is much interior space forced ventilation may be needed. Such an installation should be planned and installed by experts. More and more offices are being air-conditioned but many will have to get by with natural ventilation for some time.

5. Noise. Sound-absorbing materials are being used increasingly for ceilings, even where normal noise is not considered excessive. Noisy machines should be segregated.

6. Electricity. Dictating machines, electric typewriters, desk lamps and other equipment require outlets and extension cords, which should be arranged to avoid tripping hazards.

7. Floor maintenance. Defective tiles or boards should be repaired immediately. Floor finishes should be selected for antislip qualities. Special care is needed on stairways and at elevator entrances.

8. Glass doors should be painted with some conspicuous eye-level design to prevent persons walking into them. * * *

Pile Right for Safe Storage

Proper storage of materials, tools, and parts is simply good housekeeping, and good housekeeping is common-sense arrangement of items that go into an operation.

Two main points should be remembered. Items must be piled and arranged so (1) they can't fall and (2) they're readily accessible and can be easily handled.

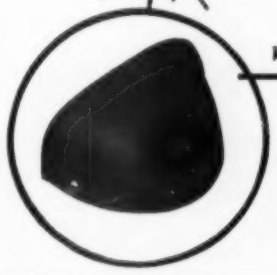
Pile material so it won't fall on somebody, and store it out of the way of traffic. Pick a storage spot that doesn't create a hazard for plant traffic or require that heavy traffic lanes be crossed to reach it.

For example, lumber should not be piled where workers continually have to cross a heavily traveled plant roadway to get to it. It should be piled out in the open, with access from all sides, where the boards can be handled easily.

. . . AND IT FELL ON HIS COMPROMISE

The finest in foot protection is a pair of safety shoes, but you probably have at least one man in your plant who doesn't wear them.

For him the best compromise is StaSafe Toe Clips, impact resistant steel clips that can be permanently nailed or temporarily fastened directly to his work shoes. Lightweight and low cost StaSafe Toe Clips combine comfort with protection.



Write in Today for Toe Clip Bulletin S-6.

Standard Safety Equipment Co.
232 West Ontario Street, Chicago 10, Illinois
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855 East 152nd Street, Cleveland 10, Ohio
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BODY PROTECTION
Acme gas masks, respirators, watchemoket eye savers, goggles, faceshields, helmets, hoods, masks, sweatbands, all types of work gloves and all types of aprons, all types of leggings, all the body & hand protection of asbestos—leather—duck—plastic.

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Safety signs, cans, pumps, syphons, filters, belts, boards, stretchers, fire-blankets & curtains fa-kits, goggle cleaning cabinets, eyewash fountains, all types safety lights, ladder shoes, protective skin creams and many other types of safety equipment.

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For Safety
Guardi-Ann Hat
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Combines utmost protection and style. Exclusive patented features found in no other hat.

Write for Free Sample or Order Direct from us

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KOOL-MITT*
Made Especially for Foundry Use and Extremely Hot Jobs

SINGER'S new KOOL-MITT is ideal for use wherever any other mitt has proved inadequate. It is made for efficient and economical use in foundries, heat treating plants, steel mills, pottery works, etc.

KOOL-MITT is unique because it consists of three layers of materials:—
(1) ASBESTOS protects leather from shrinking and gives fireproof protection.
(2) LEATHER gives the mitten long life and maximum protection against sharp and abrasive surfaces.
(3) WOOL to provide maximum insulation.

This mitt is stitched with steel staples for long life . . . outlasts up to four pairs of reinforced asbestos mitts and in some instances has replaced asbestos gloves.

Write today for prices and samples.

*Pat. Appld. For

SINGER
GLOVE MFG. CO.
860 W. Wood St.
CHICAGO 22
Work Gloves That "Sing"

Seven important points are:

1. Give each pile a firm foundation and start it right.
2. Don't pile material too high for safe lifting and handling.
3. Allow ample passageways. Observe clearance rules at aisles, sprinkler heads, and railroad tracks.
4. Never obstruct the path to fire-fighting equipment. Keep fire doors clear.
5. Cross-tie tiers, when possible, so they support each other.
6. When there is danger of the pile being insecure, interlock the tiers with long boards.
7. When piling material in buildings, learn the safe load limit of that particular floor and observe it.

Use and Misuse of Compressed Air

Compressed air is an important production tool. But misuse can result in serious—even fatal—injuries.

Compressed air should never be used for cleaning work areas. It scatters dust and chips, and flying particles may endanger persons nearby.

Air hoses should never be used to blow dirt off clothes or hair. Foreign bodies may become embedded in the skin, or serious eye or ear injuries may result.

Before an air line is opened, be sure that fittings are properly connected. The trigger mechanism on the tool and the control valve on the hose should be in a closed position to prevent the tool or air line whipping about when the air is turned on.

When changing tools, air should be turned off at its source. Hose should never be kinked for this purpose.

Close supervision and emphatic warnings may be needed to prevent the use of compressed air for practical jokes. Application of air hose to any part of the body is dangerous and can result in death.

Protection Against Wind

Damage from windstorms may occur in any section of the country and the menace is not limited to any season. Tornadoes, cyclones and hurricanes are more frequent in the milder months while destructive blizzards cause heavy damage in the northern sections during winter.

Roof coverings, copings and flashings are especially vulnerable. In addition, outside structures such as stacks, ventilators, canopies, signs and cranes should be designed and anchored to resist wind, and should be maintained.

Wood- and steel-deck roofs need special anchorage to resist lifting by strong winds. Standard roof anchorage is designed to resist gust velocities of 90 mph. In most cases this will protect against minor tornadic storms and reduce the extent of damage outside the vortex of a severe tornado.

The vortex of a tornado rarely strikes a plant but there are many storms severe enough to tear off outside structures and plank-on-timber of joisted roofs that are not anchored on. Such forces are encountered in severe gales and thunder squalls as well as in minor tornadoes and on the edges of a major tornado.

Life Guard RAIN SUITS
NEOPRENE-NYLON WATERPROOF CLOTHING
LINEMEN—SERVICE CREWS

NEW
FIELD TESTED
SAFETY APPROVED

Available in many models

Open Front & Slip Over Head Jackets

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OIL — ACID
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"Life Guard" Linemen Suits are FEATHER-WEIGHT; constructed of durable neoprene-nylon and offer complete protection against adverse weather conditions. Will NOT crack or peel in any temperature change.

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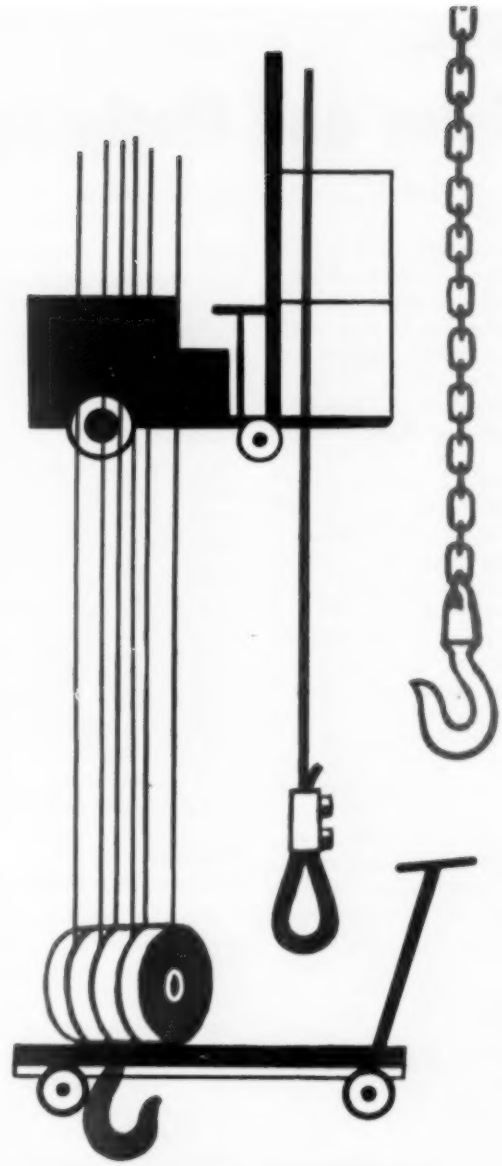
• • •

EFFICIENT METHODS of handling materials have made possible more goods for more people, with less risk to the men who produce them. Plants are being laid out to facilitate the flow of materials, and processes are becoming increasingly automatic.

The safety and production departments have a mutual interest in these developments. Reduction in handling operations means fewer opportunities for injury.

Handling objects is involved in between 20 and 25 per cent of occupational injuries, with a high proportion of fatalities and permanent disability cases among them. Preventing these requires close teamwork between the safety department and all levels of management and supervision.

To get the full value of mechanized materials handling, safety features must be kept in mind in the specifications, installation, operation and maintenance.



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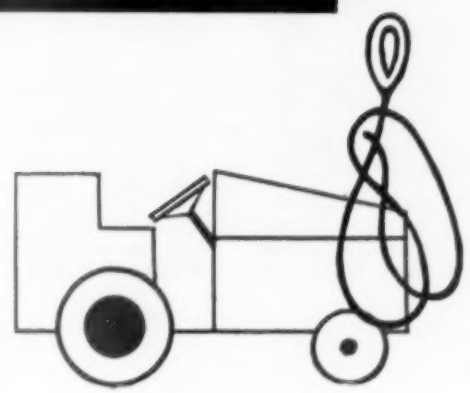
MATERIALS HANDLING



Principles and Methods

MATERIALS HANDLING is the movement of objects in the horizontal plane, in the vertical plane, or in a combination of the two. Objects vary in weight and size.

Every time an object is handled — by manual or mechanical methods — there is exposure to accident.

Safety problems include prevention of sprains, strains, back injuries, contusions and fractures. These methods help:

—Using mechanical handling devices where possible.

—Training operators of equipment.

—Training men who handle objects manually in safest and easiest methods.

—Assigning men physically fit for such work through pre-employment examinations and job studies.

Manual movement. When an object is to be moved manually, its weight is the important factor. Height to be lifted and distance to be traveled also are important. Environmental conditions may bring exposures that cannot always be predicted.

Mechanical movement. Since mechanical lifts and propels the weight, height to be lifted and distance to be traveled are the important factors. The greater the distance traveled with the load, the greater the chance of dropping it or colliding with objects.

SETTING a bridge plate (gang plank) with a fork truck. Plate is held securely in place and has toeboards to prevent trucks rolling off. (Pure Oil Co.)

Exposures in Manual Handling

Simple equipment is often needed for manual lifting and transporting. Training, supervision and housekeeping will control these causes:

—Incorrect lifting or carrying techniques.

—Attempting to lift weights beyond the worker's capacity.

—Lack of coordination among workers lifting together.

—Cluttered aisles, floors, and stairs.

—Failure to use equipment provided.

—Showing off.

Exposures in Mechanized Handling

Mechanized handling equipment also poses safety problems. When such devices are used, strains are minimized but falling object and collision accidents (with crushed hands and feet) may increase significantly.

Injuries from operation of mechanical devices may usually be traced to:

—Objects falling from carrier.

—Inadequate training of operators.

—Faulty plant layout.

—Horseplay.

—Devices inadequate for the job.

—Failure to use available equipment.

—Poor housekeeping.

—Excess handling between operations or at work stations.

References—Materials Handling, General

National Safety Council: Accident Prevention Manual for Industrial Operations, 1955.
—Materials Handling Accidents; Safety Reprint 52.
—Dock Plates and Gang Planks; Data Sheet D-318.
—Steel Strapping; Data Sheet D-315.
—Skids; Data Sheet D-260.

National Safety News: Our Aging Plants; Leo J. Pantas, Jan. 1951.
—Materials - Handling Equipment in Action; J. R. Clemens, Apr. 1951.
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—The Freight House Goes Modern; Apr. 1953.
—Standardization's Neglected Field; Nathaniel Warshaw, June 1954.
—Automatic Units in an Automatic Factory; F. R. Swanson, May 1955.
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—Planning for Safer Materials Handling; Richard J. Sweeney, Nov. 1956.

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—Material Handling, Principles, Equipment and Methods; Harry E. Stocker, Prentice-Hall, 1951.

TWO-LEG sling of wire rope lifts 4000 lbs. of steel pipe. The 13½-ft. sling has a loop with a thimble and hook at one end, held fast by a special clamp attachment. The other end is attached to a ring by means of a thimble and clamp. (Jones & Laughlin Steel Corp.)

Injuries from operation of mechanical devices may usually be traced to:

—Objects falling from carrier.

—Inadequate training of operators.

—Faulty plant layout.

—Horseplay.

—Devices inadequate for the job.

—Failure to use available equipment.

—Poor housekeeping.

—Excess handling between operations or at work stations.

Organization for Handling

Purchase of an industrial truck or a handling device is not sufficient to bring any significant reduction in accident frequency. An organized plan should cover the following:

1. Study accident-occurrence data.
2. Determine location and types of accidents.
3. Inspect conditions and study causes of accidents.
4. Correlate accident data and inspection findings.
5. Prepare management report.

1. Study Accident Data

There are no fixed rules; each plant's experience is different.

—*To page 198*

Section 7—Materials Handling

Trucks and Tractors

WHEELED VEHICLES have been designed for every hauling job. Some also perform lifting operations. Both hand- and power-operated models keep goods flowing in factories, warehouses, docks and railroad terminals.

Power Trucks

Industrial power trucks are operated by engines using gasoline or liquefied-petroleum gas, or by storage batteries. Many trucks designed for gas have been converted to LPG.

Power trucks should be constructed and equipped to comply with the power truck code specifications for fire protection. These specifications are minimum requirements for trucks in ordinary locations. For hazardous locations requirements are much stricter.

Hazardous locations are defined by the National Electrical Code as:

ELECTRIC FORK TRUCK, 4000 lbs. capacity, operates in narrow aisles and lifts palletized loads to considerable heights. (Yale and Town Manufacturing Co.)

Class I—Where flammable gases or vapors may be present.

Class II—Combustible dust.

Class III—Easily ignitable fibers or flyings.

The *Safety Code for Industrial Power Trucks* (ASA B56.1-1950) stipulates that electrical or gas-powered trucks may not be used in these locations unless specifically approved by the inspection authority for the location involved.

Types of trucks covered by the ASA code include high-lift, low-lift, fork and platform high- and low-lift trucks, tractors, saddle trucks, crane trucks, powered hand trucks and other special trucks.

Exhaust purifiers. Where trucks are operated in confined spaces, carbon monoxide from internal-combustion engines is a problem. Use of catalytic exhaust on trucks permits operation indoors where there is good ventilation. Types of exhaust purifiers are available for white (unleaded) gasoline, liquefied petroleum gas, leaded gas, and diesel fuel.

Preventive maintenance of trucks keeps down monoxide in the exhaust. This includes a frequent check of the carburetor since too rich a mixture can produce excessive quantities of the gas.

Fork lift truck. This has become the most widely used power truck. It is a cantilever type, self-loading truck with vertical uprights and elevating mechanism. Fork trucks permit handling of loads on shallow double-faced pallets as well as skids. Pallets afford a wider load distribution, an advantage in tiering.

Attachments are used for handling a variety of packaged and bulk materials. Clamps permit moving cartons, bales and drums without pallets.

Dumping attachments are used for discharging liquid, solid and granular materials.

Canopy guards are required by code for fork trucks where the operator is exposed to danger from falling objects. The guard should be strong enough to support a capacity load and have no opening larger than the smallest package carried.

Scoop trucks shovel loose materials and elevate and dump them into hoppers and bins.

Powered hand truck. The truck, similar to a hand lift truck, is powered by storage battery and controlled by a walking operator. A motor on the forward wheels supplies power for hauling.

A powered hand truck should have a dead-man control so brakes will be applied instantly when the operator releases the handle.

Platform truck. Used for hauling baggage, mail and packages at railroad stations and steamship piers and in industry for some jobs where loads cannot be palletized. Loading is by hand.

Low-lift platform truck. Platform elevates just enough for horizontal movement. It picks up loaded skids, moves them and sets them down without manual handling or use of other equipment.

High-lift truck. This may be a fork, platform or special type. It has a lifting mechanism to permit tiering one load on another.

References—Trucks, Hoists, Cranes, Conveyors

National Safety Council: Powered Hand Trucks; Data Sheet D-317.
—How High Stacking Affects Fork Truck Stability; Safety Reprint Gen. 27.

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—It Goes Where Men Can't (Conveyors); Jervis C. Webb, Oct. 1951.
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—When It Comes to Conveyors; H. C. Keller, July 1955.
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American Standards Assn.: Conveyors, Cableways and Related Equipment, Safety Code for, B20.1-1947.

Miscellaneous: See manuals published by manufacturers of equipment and their trade associations.

Ram trucks. This type has vertical uprights and elevating mechanism like a fork truck. It is normally equipped with a single ram for picking up coils or rolls.

Roll-handling trucks for handling paper are equipped with a cable drum and two cables. Hooks on the cables hook over the ends of a rod which serves as an axle for the roll.

Crane trucks are equipped with boom, cable and drum. Hooks, spreaders and slings are used for moving heavy unit loads and objects too large to be handled on truck platforms or forks.

Tractors and trailers are used where large quantities of materials are moved relatively long distances, as at freight terminals and piers. Loading and unloading is done manually or by crane or other equipment.

Hand Trucks

The two-wheeled hand truck, designed for handling bags, drums, barrels, cartons and beverage cases, comes in a variety of sizes and types. It can be equipped with brakes.

Hand platform trucks are available in several designs with capacities for 150 to 2,000 lbs. They usually are designed to be pushed by one of the end racks. They are suitable for short hauls.

Hand lift trucks. The load, supported on platforms or skids, is raised enough for horizontal movement and pulled by hand power. These are useful where loads are relatively light and distances short.

Wheelbarrows are useful for hauling and dumping bulk materials. They can be used where a 2- or 4-wheeled vehicle could not be maneuvered. Bodies of aluminum and magnesium alloys, and rubber tires, have made them lighter and easier to handle.

Crossover Bridges

Where loading docks are separated by railroad tracks, crossover bridges are needed. Some are of the drawbridge type; others are mounted on four pillars that can be raised or lowered quickly by push-button control.

Hoisting Equipment

A HOIST is a mechanical device, suspended overhead, used for raising or lowering loads through a vertical plane. Common types of hoisting equipment include:

1. Block and tackle
2. Hand chain hoist
3. Electric hoist
4. Air-operated hoist
5. Portable floor cranes
6. Jib cranes

Block and tackle. Blocks threaded with fiber or wire rope are used for raising and lowering scaffolds, hoisting objects, and other industrial purposes.

When used to lift heavy materials or to hold loads suspended, as on heavy-duty scaffolds, wire rope is more serviceable than fiber rope. Wire rope is too stiff for manual handling and requires a winch for operating.

Hand chain hoists may be used where overhead cranes cannot be installed because of lack of head room. They also handle heavy pieces at machines. One hoist may handle the work at several machines.

Steel is recommended for load-sustaining parts. It withstands sudden shock better than cast iron and is lighter in weight. Chain should be welded, and of quality steel.

Each hoist should be equipped with a braking device which automatically locks the load when hoisting is stopped.

Chains and sheaves should be lubricated at intervals, depending on atmospheric conditions.

Electric hoists range in capacity from ⅛ to 20 tons, are faster than hand hoists and less fatiguing for large loads. The light-duty hoist uses link chain for lifting. The heavy-duty hoist uses wire rope.

Limit stops prevent the hoist from traveling too far in case the operating handle is not released in time.

Air hoists operate on compressed air. They are used where sparks from electric equipment might be a hazard, or where smoothness of operation is important. The air hoist is limited in travel because of dependence on air lines.

Grabs, grips and tongs of several types have been developed for use with overhead handling equipment, such as cranes, monorails and hoists. Some can handle a variety of objects while others are more specialized.

Portable floor cranes or hoists are mounted on wheels and can be moved either by hand or under their own power. These raise and lower loads in a vertical line. They will not rotate around a fixed point.

Electric hoists should be grounded to prevent shock in case of short circuit.

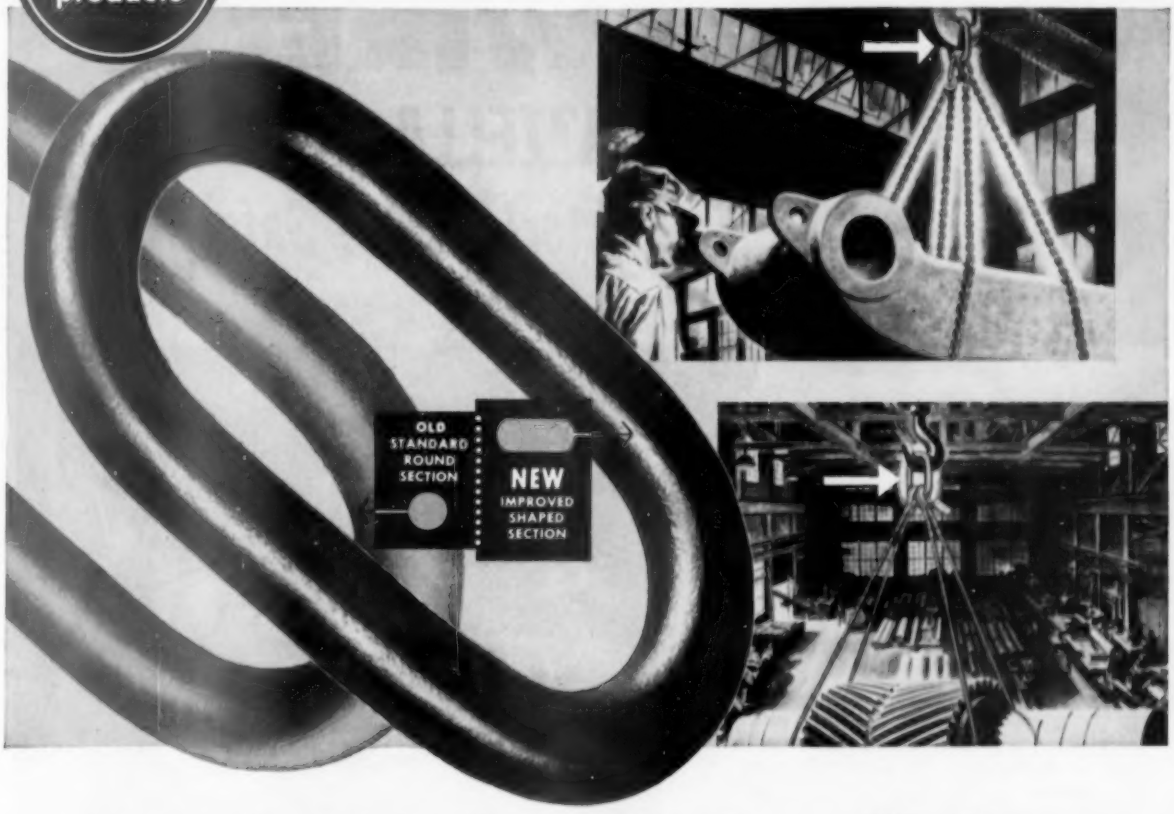
Jib cranes lift, lower and rotate loads within the circle covered by a rotating arm or jib upon which runs a trolley. The jib is usually supported from a wall or column. A hoist, hand-operated, air or electric, is suspended from the trolley. A substantial stop at the end of the jib arm prevents the trolley running off. * * *

STORING a drum of thinner on the top rack of a paint storage room is done easily with a floor-operated bridge crane and a movable ladder. Other safety features are: vapor-proof electrical fixtures, spark-resistant floors and tools, exhaust fans to keep vapors below explosive concentrations, spring-closing brass valves on drums, and drip pans under valves. (Westinghouse)

ACCO products

ACCO Registered* Slings–Wire Rope & Chain

THE STANDARD OF EFFICIENCY AND SAFETY



New Master Link for Slings—Either Chain or Wire Rope—Holds Its Form Under Loads Up to 18% Greater

• Latest product of the continuing research behind ACCO *Registered* Slings is this new Shaped Section Master Link. ACCO's engineers found that by shaping the link—as shown above—they could give it more "dimensional stability"—a better "section modulus." Translated into layman's English this means that the new shaped link, without any increase in weight, will withstand deformation under loads up to 18% greater than a standard round section link will.

Just as shaping a quantity of metal into a structural I-Beam allows it to handle greater loads than it could as a solid beam, so does ACCO's Shaped Section Master Link give better performance under greater loads than a link with a round section.

The new shaped link is smoother and provides a greater factor of safety. It is a better and safer link. It costs us more to make. But it will be offered on all ACCO *Registered* Slings—both wire rope and chain—at no increase in price.

AN EXTRA BONUS OF SAFETY

This latest technological advance adds an extra bonus of safety to ACCO *Registered* Slings.

Each component of an ACCO *Registered* Sling is made from the best materials procurable for its use. Each part must prove to have strength equal to or greater than the sling body. All hooks for ACCO *Registered* Slings are Magnaflux tested. Then these components are assembled into slings according to carefully engineered designs that have proved themselves in rigorous field tests.

The completed sling is then individually proof-tested to twice the working load limit. Then and only then, is it awarded the coveted ACCO Registration Certificate and the identifying ring or tag.

SEE YOUR DISTRIBUTOR

ACCO *Registered* Slings are readily available from a distributor near you. If you don't know him write to our Bridgeport office for his name.

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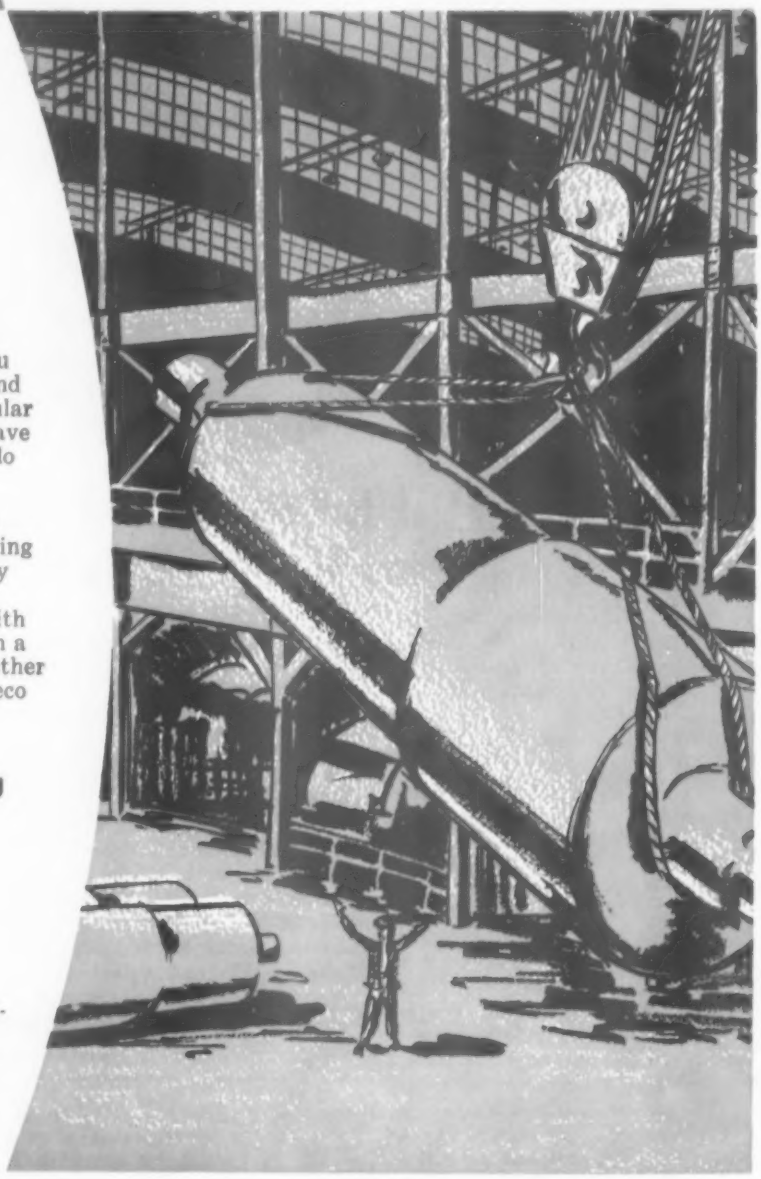
Lift Anything! with WIRECO MAZZELLA SLINGS

Faster! Easier! Safer!



flexible! Pliable Mazzella Slings in whatever combination used, hug the load closer . . . perform with more full-gripping action . . . to lift the load faster, safer, at lower cost! Such flexibility gives you ease of handling that helps save men and money!

durable! Mazzella slings are rugged and durable! Let your Wireco Distributor introduce you to the dozens of Mazzella Slings and Fittings designed for your particular job . . . in a sling size that will save you money and at the same time do the job more efficiently!

versatile! Three parts through nine parts, Mazzella provides a sling for every need! These extremely versatile slings can be used in combinations or in conjunction with other fittings. All are woven from a continuous wire rope twisted together to form the sling body. Your Wireco Distributor will help you decide which is ideal for your needs.

Here's Mazzella Sling Construction

This construction makes the most versatile of all multipart slings. No matter what the job, you get a custom-made combination of durability and flexibility in Wireco Mazzella Slings.

See your WIRECO DISTRIBUTOR

Wire Rope and Slings

HIGH TENSILE STRENGTH and moderate flexibility qualify wire rope for heavy lifting and haulage and for supporting rigging. It is serviceable under varying weather conditions but should not be exposed to excessive heat or corrosive substances nor dragged over rough surfaces.

In selecting wire rope, the following should be considered:

1. Size.
2. Construction.
3. Grade.
4. Equipment on which rope is to operate.
5. Handling, installation and maintenance of rope.

Constructions

Much useful data on wire rope, slings and attachments will be found in the catalogs of the leading manufacturers. In addition to listing the types available, these catalogs also give helpful hints on use, maintenance and lubrication.

Wire rope is manufactured in a variety of constructions, each designed for certain service conditions.

In designating construction, the first numeral identifies the number of strands in the rope, the second, the number of wires in each strand. This is followed by a term describing the geometric arrangements of wires in each strand, e.g., 6 x 19 Filler Wire.

The 6 x 19 construction is the most generally useful. As the number of wires per strand increases, flexibility and reserve strength increase, but ability to withstand abrasion decreases. A 6 x 7 construction has higher resistance to abrasion but less flexibility.

The core serves as a foundation for the strands. Three types of cores are used: (1) fiber, (2) independent wire rope and (3) wire strand.

Fiber gives elasticity to the rope and has adequate strength for normal operating conditions.

Metal cores are used where maximum strength and minimum stretch are important; where heavy loads or overwinding on a drum causes excessive pressure of strands against the core, or where temperature would dry out a fiber core.

Type of lay. There are two general methods of laying up rope: (1) Regular lay, in which the wires in the strand are laid in the opposite direction to that of the strands of the rope, so that on the outside of the rope the wires lay approximately parallel to the rope axis; (2) Lang lay, in which wires and strands are laid in the same direction.

Regular lay rope is standard for most applications. It is easier to handle during installation and less susceptible to kinking.

Lang lay rope has good flexibility and resistance to abrasion and fatigue.

Wire rope is made either right or left lay. In most cases it makes little or no difference which type is used. Right lay is standard.

Rope Grades

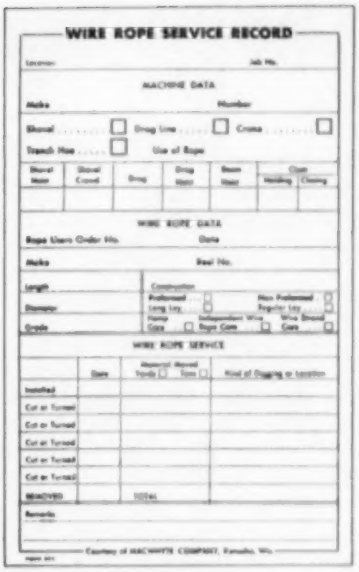
Rope wires usually are made of the following materials and designated by their names (Minimum tensile strengths are quoted from Federal Specifications RR-571a.):

Improved plow steel. Has highest strength and toughness and most wear-resistant properties. Most frequently selected for heavy-duty service, as in deep shafts and on excavating machinery. Minimum tensile strengths, 218,000-244,000 psi.

Plow steel. Strength about 15 per cent less than improved plow steel. Serviceable for haulage, hoisting, logging and miscellaneous service. Minimum tensile strengths, 190,000-212,000 psi.

Mild plow steel. Combines toughness with pliability, making it capable of undergoing repeated impact stresses. Used principally for cable tool drilling. Minimum tensile strengths, 165,000-184,000 psi.

—*To page 200*

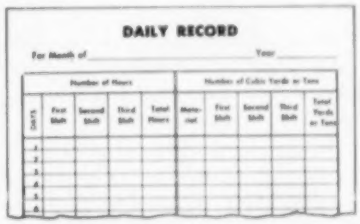


WIRE ROPE SERVICE RECORD

MACHINE DATA

WIRE ROPE DATA

WIRE ROPE SERVICE



DAILY RECORD

SERVICE RECORD card keeps track of wire rope performance on construction jobs. Data on daily output of machine are recorded on reverse side of card. (Macwhyte Co.)

WIRE ROPE STRENGTH
(⅝-in rope)

Grades	Breaking Strength (Lbs.)
Iron	12,500
Traction steel	23,000
Mild plow steel	24,600
Plow steel	28,300
Improved plow steel	32,600

References—Wire Rope

National Safety Council: Recommended Loads for Wire Rope Slings; Data Sheet D-380.

—Steel Sinews; Safety Reprint Con. 5.

National Safety News: How Safe Are Your Slings; W. C. Richards, Aug. 1953.

—You Can Depend on Wire Rope; Sept. 1954.

—Lifting Safely with Wire Rope; T. O. Aho, Nov. 1955.

—Let's Be Practical About Sling Loads; H. M. Wilson, May 1956.

—How About Hoists? B. J. Povolny, Jan. 1957.

Chains and Slings

FOR INDUSTRY'S heaviest hoisting and haulage jobs chains will give dependable service. They combine strength, flexibility and resistance to heat, shock and corrosion. Attachments suitable for many uses are available.

Specifications for various types of chain have been compiled by the American Society for Testing Materials. Safe loads may be determined from tables in manufacturers' handbooks.

Safe working load means the maximum load which should be applied to a chain in direct tension.

Breaking loads are of no practical interest to the user. They are often misleading and may encourage unsafe practices.

Proof test means the actual test in pounds applied to the chain and attachments before leaving the factory. Proof-test figures should not be considered safe working loads.

These tests are followed by visual link-by-link inspection by experienced inspectors.

Types of Chain

Conditions under which chain will operate should be considered during selection. When ordering, the manufacturer should be consulted about applications.

Factors to be considered are: impact loading, bumpy craneways, rapid lifts, sudden stops, heat, corrosive atmosphere and unnatural strains.

Types commonly used in industrial operations are:

Wrought iron chain (crane or dredge) has high resistance to shock fatigue and corrosion. This chain has close links and is used for slings, hoists, cranes, power shovels and marine purposes where human life and property depend on its endurance.

Welded steel chain (low carbon) is made in three common types: Proof Coil, BBB, and Steel Loading.

Proof Coil is used principally for towing, binding, logging and similar operations. Links are comparatively long. Proof coil chain is not suitable for lifting or for slings.

BBB Coil is a higher grade than proof coil, with safe working load about 25 per cent greater. Shorter links give greater flexibility. BBB coil chain is not suitable for lifting or for slings.

Steel loading chain has a tensile strength about 50 per cent higher than BBB. It is used in the logging industry for binding and loading logs and in oil fields for handling pipe and heavy equipment.

High-test chain (high carbon) is heat-treated to give it high tensile strength and resistance to impact loads. Tensile strength is almost double that of ordinary steel chain. Ductility is moderate. Where resistance to wear is most important, it permits use of smaller and lighter chain.

Alloy steel chain (general purpose) has exceptional strength for weight and size, is resistant to some types of corrosion, and frequently is used where maximum tensile strength and resistance to abrasion—with reasonable resistance to impact—is required.

Special purpose alloy chain is considerably higher in cost and is used on high-temperature operations and where resistance to corrosive substances is required.

Stainless steel is high in tensile strength, fair in elongation, but low in impact resistance. It is used chiefly for ornamental installations and acid pickling.

Monel has fair tensile and impact strength and elongation. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Bronze has good elongation and fair resistance to impact, but low tensile strength. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Specialized types of chain have been developed for certain industries. Finishes sometimes are added to chains to provide added protection from corrosion or for decorative effect.

Nickel alloy steel hoisting chain is nearly twice as strong as iron chain of the same size. It meets ASTM elongation requirements for iron crane and proof coil chain. It can be used over a wider range of temperature and is relatively immune to failure resulting from fatigue stresses and cold working of the metal.

Impact resistance in heat-treated alloy steel chains does not increase in proportion to the

—*To page 205*

SAFETY HOOK on block and fall keeps load on hook until released manually. (E. D. Bullard Company)

References—Chain

National Safety News: Safer Lifts; S. N. Morrison, Nov. 1950.

—Chains That Won't Let You Down; Jess Hogans, Jan. 1953.

—Watch Those Chains; July 1953.

—No Mystery About Chain Failures; N. J. Gebert, Nov. 1953.

—Inspect Those Chains; H. F. Reid, Jr., May 1954.

—How Safe Is That Chain Hoist? E. S. Moorhead, Feb. 1956.

—Eyebolts for Angle Load Safety; M. F. Biancardi, July 1956.

Pengo Tension Wire stringer being used by the Bechtel Corporation stringing 1,033,500 CM ACSR Curlew, Calol-filled Cable for the Southern California Edison Co., Los Angeles, California.

The latest method of stringing conductors

- *Safest, most economical for transmission, distribution and even secondary lines.*
- *Its greatest savings are effected when stringing over and through energized circuits . . . by far the safest, too!*
- *Fourteen patents pending!*

Operation of the PENGO Tension Wire Stringer is almost unbelievably smooth. Because the tensioning is done on the Neoprene-Lined Bullwheels rather than on reels, conductor damage from the reels has been eliminated entirely. Due to the Neoprene lining of the Bullwheels, it is possible to use a full range of wire sizes to maximum groove capacity, which, in the case of the Model 6000-WS shown in picture, is Pheasant or 1⅜" diameter.

SMOOTH, POSITIVE CONTROL OF CONDUCTOR TENSION can be maintained at all times regardless of model or size of PENGO Tension Wire Stringer used. The large, specially designed PENGO disc brakes are mounted away from the Bullwheels to assure dissipation of the heat generated by the continuous braking action and prevent transmission of the heat to the Bullwheels.

In addition to the model shown in the picture, all series are available in low-slung trailer mounts for mountain work with separate easy-loading reel trailers.

List your requirements and send for descriptive literature and prices.

PETERSEN ENGINEERING CO.
Santa Clara, California DEPT. S
• Please send me more information on the new Pengo Tension Wire Stringer.
Name_____
Firm_____
Address_____
City_____ State_____

Made by the makers of the World-Famous
PENGO EARTH AUGERS

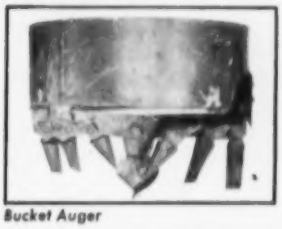
PETERSEN
ENGINEERING COMPANY
Santa Clara, Calif.

Other PENGO Products include:

24 inch Heavy Duty Flight Auger

Double-Helix Heavy Duty Auger

Offset Boring Head



Bucket Auger

Screw Bit for Small Diameter Holes

Pulling Eye

Pole and Transformer Chariot

Fiber Rope

FIBER ROPE has two qualities which make it widely used for block and tackle work, life lines and lanyards, suspended scaffolds and stagings, and in marine operations:

—It is flexible and easy to tie and splice.

—It can be handled manually.

Many types of fibers have been used for ropes. The best have good tensile strength and resistance to weather and abrasion.

For heavy loads where fiber rope of adequate strength would be too bulky, wire rope is more serviceable.

Fiber rope should never be exposed to high temperatures, acid splashes or fumes. Sharp bends should be avoided. Where a sling passes over sharp edges, pads should be used to protect the rope.

Rope should not be kept in stock for long periods. Even with careful handling and favorable storage conditions, vegetable fibers deteriorate with age. When rope is used at infrequent intervals, its age should be considered in its use and retirement.

Natural Fibers

Manila fiber is standard for tensile strength and durability. A good grade of new, clean manila rope is hard but pliant. Yellowish, it has a smooth, almost silky feel.

Sisal is the next best fiber. Strength varies from 65-80 per cent of manila. Sisal rope is yellowish, sometimes slightly green. It lacks the gloss and smoothness of good manila. Sisal fibers are stiff and have a tendency to splinter.

Mexican sisalana (henequin) lacks the strength of high-quality sisal but has been used to some extent during shortages of better grades of rope. Strength is about 60 per cent of manila.

American hemp fiber is much softer than manila. It is dark gray. It is not highly resistant to abrasion, but when tarred will give fair service on some jobs. Strength is about 80 per cent of manila.

Jute and cotton are not recommended for handling material or other uses where strength and durability are needed. Strength is about 50 per cent of manila.

Synthetic Fibers

Ropes of synthetic fibers are coming into wider use. But a higher cost has restricted their use to certain specialized operations.

Nylon has a high rating for tensile strength, toughness, flexibility and durability and is easy to handle.

Nylon rope has a higher tensile strength, wet or dry, than natural fibers and does not show marked deterioration when frozen. Melting at 480 F., it can be readily destroyed by fire but does not ignite and burn with flame. It is resistant to rot, mildew and alkalis, but is damaged by acids.

Glass fiber has high strength when dry, but low resistance to flexing and abrasion. Reportedly performs poorly when wet.

Saran resists rot and many chemicals and is practically unaffected by aging, direct sunlight and moisture. Only moderate resistance to abrasion and temperature.

Care of Rope

New rope, before being placed in service, should be thoroughly inspected throughout its length. It should be uncoiled by laying the coil on the floor with inside end down; then reach down through the center of the coil and pull this end up, unwinding the coil counter-clockwise. If the rope uncoils in the wrong direction, the coil should be turned over and the end pulled out on the other side.

Rope loaded over 75 per cent of its breaking strength will be permanently damaged. Damage can be detected by examination of inside threads, which will be broken in proportion to the overload.

Kinking is highly destructive to rope. It may cause failure when the rope is again put under strain. Kinking is more likely to occur when rope is wet.

Sometimes ropes become kinked after use. One method of removing these kinks is to open up the coil and recoil left-handedly. When the coil is completed, the free end is brought through the coil and the rope is then coiled right-handedly.

Uncoiling the rope and stretching it out in a single length is another method of unkinking where space permits.

Rope should be stored in a dry place where it will not be exposed to high temperature and where air may circulate through the coils.

Rope deteriorates quickly if saturated with water and not properly dried. Alternate wetting and drying will also cause rapid deterioration.

When lengths of rope must be joined they should be spliced, not knotted. A well-made long splice will retain up to 90 per cent of the strength of the rope; a knot, only 50 per cent.

Inspection should include examination of the entire rope for wear, abrasion, broken or cut fibers, displacement of yarns or strands, discoloration or rotting.

To inspect inner fibers, the rope should be untwisted in several places to make sure they are bright, clear and unspotted.

Rope should be replaced when it has lost its feel of pliability or stretch, or when the fibers have lost their luster and are dry and brittle. * * *

References—Fiber Rope

National Safety Council: Sisal Rope; Data Sheet D-261.

National Safety News: Facts About Fiber Rope; June 1955.

Miscellaneous: Handbook of Rigging; W. E. Rossnagel, McGraw Hill, 1950.

FREE TO YOU

This helpful, informative Macwhyte *Safe-Lock* Wire Rope Assemblies Catalog 5601

Macwhyte Wire Rope Assemblies have a wide variety of applications. They may be used for operating controls, as a part of machinery and equipment, or for slings and hoists.

They are widely used on small gasoline powered equipment, outboard motors, mining machines, agricultural implements, automotive equipment, aircraft, boats and yachts, production machinery, laboratory equipment, etc.

This catalog will prove invaluable to you in determining assemblies for your needs. For your free copy write on your company letterhead to: Macwhyte Company, Kenosha, Wisconsin. You'll receive your free Catalog postpaid, by return mail.

MACWHYTE COMPANY

2906 Fourteenth Ave., Kenosha, Wis.

1105A5

Principles and Methods

—*From page 188*

Records need not be elaborate or too time-consuming. For each accident, record:

1. Date.
2. Name of injured.
3. Age and sex.
4. Location.
5. Description of operation.
6. Name of supervisor.
7. Cause and nature of injury.

A significant exposure, at least 9 months, will give an accurate picture of the exposure. If less than 100 disabling injuries have occurred, a review of first-aid cases may reveal many minor material-handling injuries that could have been serious.

The cause of the accident, not merely the result, should be considered. For example, the report might show a case of dermatitis or a fall on an oil-soaked floor while the real cause might be handling oil-soaked materials in a leaky tote pan.

2. Locate and Determine Types of Problems

Next step is the study of material-handling cases segregated from the total to determine locations and types of handling exposures. Accidents may be grouped by:

—Department.
—Production line.
—Shift.
—Machine or operation.
—Type of material handled.
—Equipment used.

Such a study may not be necessary or practicable. Routine inspection will often reveal situations and procedures that have not yet resulted in accidents. If extensive changes in techniques or expensive mechanized equipment are recommended, improved accident experience is a good talking point.

3. Inspection and Study of Causes

Each accident or exposure should be evaluated after careful study of these four items:

—Plant layout.
—Practices and procedures.
—Housekeeping.
—Methods.

Plant layout. Poor layout may cause unnecessary handling. Inadequate aisles and storage space cause congestion and disorder. Such conditions usually are beyond control of the supervisor.

Efficient layout minimizes manual handling and reduces interference of men and materials in movement.

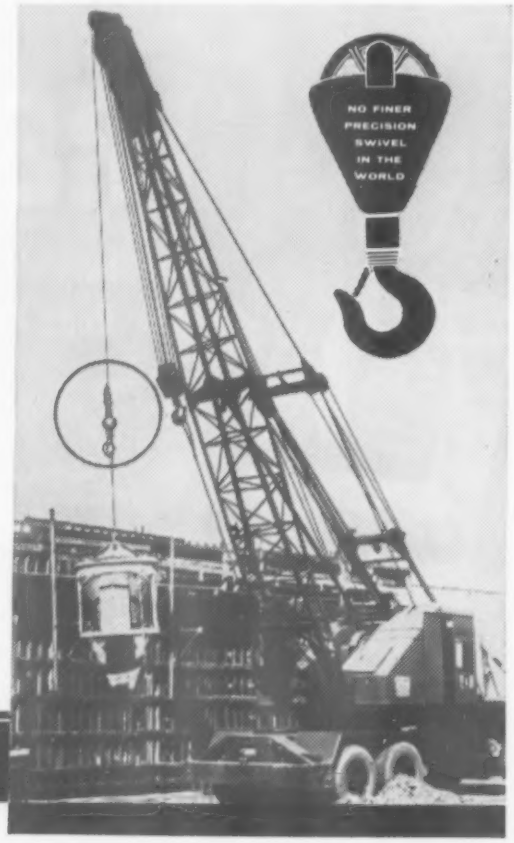
Work practices. A study of each operation may reveal unsafe practices or lack of proper instruction. More training may be necessary. Definite procedures in the use of industrial trucks, hoists, cranes and conveyors may be necessary. Safe lifting methods, horseplay, and showing off also need attention.

Films are available for training in lifting methods. Safetygraphs produced by the National Safety

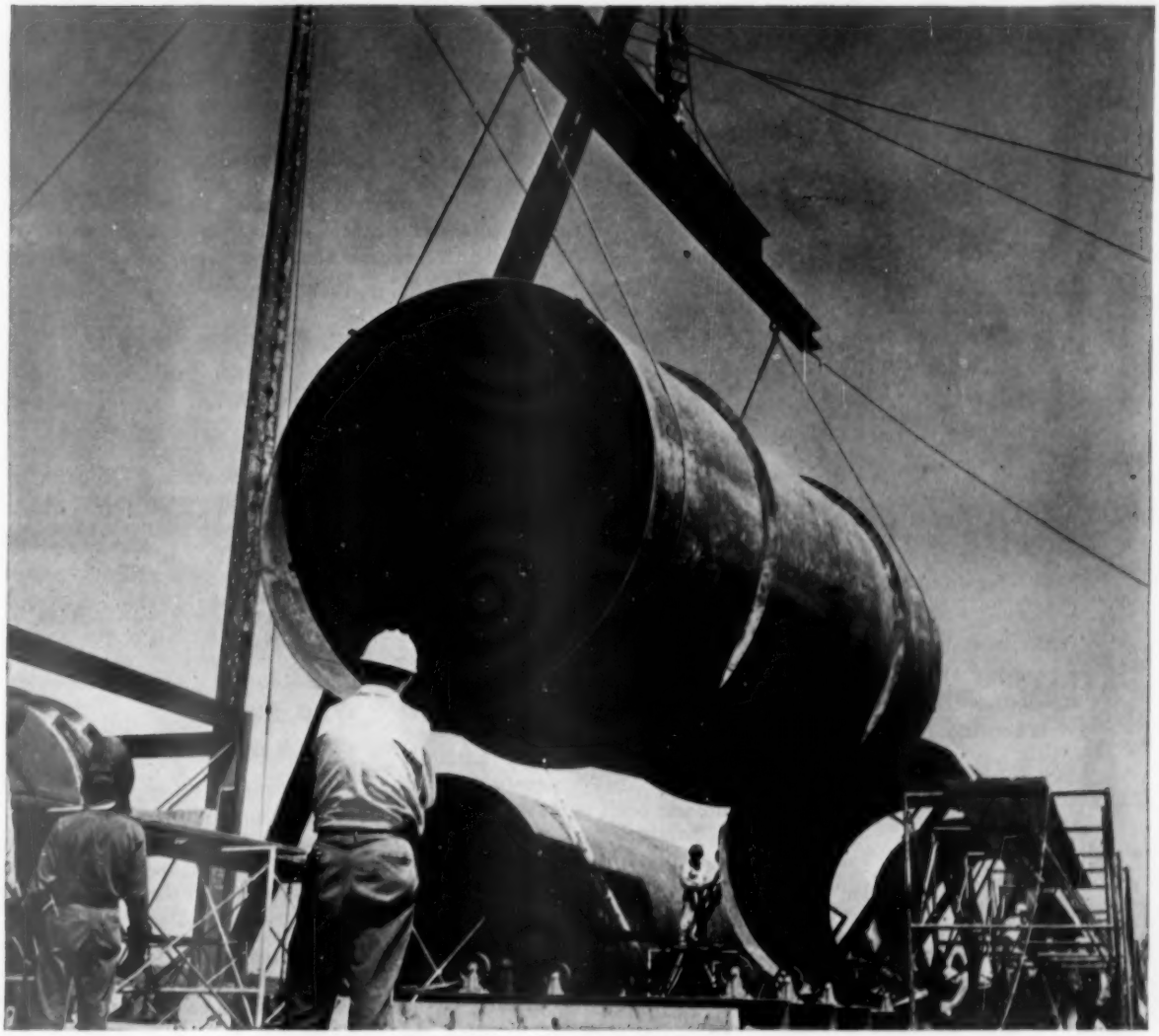
Maximum
SAFETY
plus
SAVINGS

1. Faster hoisting due to non-spinning loads.
2. Faster load placement due to easy load turning.
3. Faster rigging due to elimination of cranky wire rope performance.
4. Elimination of twists and kinks means longer wire rope life.
5. Safer load placements due to non-spinning loads.

24 standard types available from ½ ton to 250 ton working load



PRODUCTS OF
GENERAL MACHINE & WELDING WORKS INC.
1100 East Second St., Pomona, Calif.
P. O. BOX 938 DEPT. N. S.



A job for sturdy slings

The hurry call goes out for slings on a job like this, where the load is heavy, cumbersome, touchy. Here two Bethlehem slings were photographed lifting a section of fabricated pipe 14 ft 8 in. in diameter. The project involved more than 1.6 miles of pipe-line construction in the mountains of northeastern Pennsylvania.

These were simple slings, the most basic of all—a single-part type with spliced loops. Though not large, they were tremendously strong, being constructed wholly of Purple Strand, Bethlehem's finest wire rope. They made the ponderous fabricated pipe seem almost feather-light.

There are, of course, numerous other kinds of Bethlehem slings that could have been used. That's one advantage of purchasing your slings from Bethlehem. The widest possible choice is always available. You can select from a large assortment of grommets, braided types, bridle combinations, and others. Special slings, made to meet unusual situations, can also be furnished quickly.

Whenever you're faced with a lifting problem, Bethlehem engineers will gladly offer suggestions. They live with work of this kind, and their recommendations are thoroughly dependable. Please feel free to call them when their services can be helpful to your shop or field personnel.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

CM HERC-ALLOY®

...the original alloy steel chain

TO SERVE YOU BETTER: Herc-Alloy chain assemblies can now be ordered with either of two types of coupling links.

Herc-Alloy sling assembled with welded, heat treated alloy steel coupling link
TRADITIONAL
Herc-Alloy sling assembled with heat treated, alloy steel Hammerlock coupling link
NEW

Hammerlok®

...the "do-it-yourself" reusable coupling link that enables you to assemble or rebuild your own Herc-Alloy sling chains with all components furnished by your local distributor.

CALL YOUR CM CHAIN DISTRIBUTOR or write for helpful literature on alloy chain assembly, care, use and inspection.

CM HOISTS AND CHAIN

COLUMBUS McKINNON

CHAIN CORPORATION

TONAWANDA, NEW YORK

Regional Offices: New York • Chicago • Cleveland

In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

Council are good for training small groups.

Robots which show the physiological effects of lifting methods can be used for effective demonstrations.

Housekeeping. Lack of aisle maintenance or supervision of storage of materials within aisle boundaries results in congestion and disorder. Adequate racks and bins for raw stock and finished parts improve housekeeping.

Defective and poorly maintained floors cause spillage and result in accidents chargeable to materials handling. These conditions usually are easy to control but often go unnoticed.

Methods. Look for items that have a bearing on possible accident sources: Two- or three-man lifts; excessive handling between operations; inadequate handling equipment, and unnecessary handling at work stations.

Compilation of a process or operation chart for each work station or each unit of handling equipment may prove helpful. Studying each operation with excess handling and noting possible hazards will reveal exposures that may be overlooked in visual inspection. Such a study may be concentrated at a single machine or operational cycle, or may include movement of material from one location to another.

Once the facts are on hand, the engineering procedure of elimination, combination, change of sequence or simplification through mechanization, can minimize exposures.

4. Correlation of Data

Facts and figures now on hand prove the existence of exposures as indicated by accident experience.

In submitting recommendations to management, this must be remembered: Corrective measures must be considered from an economic standpoint. Are extensive changes warranted, not only from the accident point of view but also from the standpoint of available capital, effect on production, and over-all operating efficiency? In many cases a comparatively inexpensive device or method will improve the situation.

Where the problem appears to warrant extensive changes in plant layout, or expensive equipment, the presentation must be thorough. Usually it will be necessary to justify extensive changes with factors other than safety. However, protection of employees is often the factor that decides the purchase.

5. Preparing Reports

The final report for top management should expand on and interpret facts. Charts and graphs may be used to present data in condensed form. The report should include a summary of the survey and the engineer's recommendations.

A report will be most effective when it offers alternative solutions. * * *

Wire Rope

—*From page 193*

Cast steel. Where strength is not the controlling factor, its pliability is important to long life. Resistant to acid mine water. (Not listed in Federal Specifications.)

Traction steel. Used in hoisting ropes for traction-type elevators. High resistance to bending fatigue and minimum abrasive action on sheaves and drums. Minimum tensile strength, about 160,000 psi.

Iron. Low tensile strength (about 70,000 psi.) but ductile. It has been used principally in elevator service where it is being replaced by traction steel.

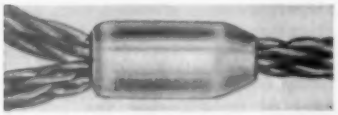
Corrosion-resisting metals. Where corrosion is a factor, stainless steel, bronze and monel metal are used frequently. All-metal ropes are preferred to fiber-core ropes.

Stainless steel is used in marine operations, on aircraft, and where rope is exposed to alkali, acids of an oxidizing nature (such as nitric), neutral brine, food products and temperatures damaging to carbon steel ropes.

Bronze is slightly stronger than

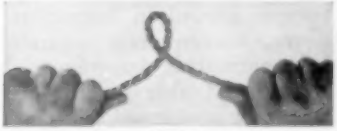
Tuffy® Sling Bulletin

Reporting the Outstanding Performance of Union Wire Rope's Machine-Braided Wire Fabric Slings.



Streamlined Ferrules — Pressed On Over Tucked-In Splices — Give Tuffy Eyes Full Strength of Sling

It's on all Tuffy slings, and it doesn't cost you a penny extra. No sling ferrule like it anywhere! The ferrule is set on the eye splice under pressure so great that the eye splice has the full strength of the Famous Tuffy machine-braided wire fabric. It makes Tuffy slings stronger and safer. And still another advantage: because Tuffy slings are easier and safer to load, they're also faster to load. Yet Tuffy super-strong, super-flexible slings cost you no more than ordinary slings.



Hardly Ever Does a Kink Put a Tuffy on the Blink!

Try to kink a Tuffy sling — with all the force you can apply with two hands and the help of your feet. Chances are you'll need a vise. If you do succeed in putting a kink in that 9-part machine-braided wire fabric, you can straighten it out quickly and without materially damaging the fabric.

Tuffy Machine-Braided Wire Fabric—Successor to Wire Rope in Slings

Ordinary wire rope had the strength required for sling loads, but fell far short on the important qualities of flexibility, kink-resistance and ease of handling. Tuffy's patented 9-part machine-braided fabric combines super flexibility with extra toughness — costs no more than ordinary slings — and has uniformity of construction impossible to get in costly hand-braided slings.

Your Tuffy Distributor is Qualified to Help You Get More Service per Dollar from Slings and Hoist Lines

Send for FREE Tuffy Handbook of Slings and Fittings

For Canada, Safety Supply Co., Toronto

Distributors Fill Orders Fast on 16 Factory-Fitted Tuffys

Tuffy slings are factory-fitted, factory packaged and easy to order. They are delivered to you as a complete package — ready to go to work right now. Your distributor is ready to serve you, and he's backed up by his nearby Union Wire Rope depot.

No Complicated Specifications in Figuring and Ordering Your Tuffy Needs

Tuffys are tailored to special uses. Just select the Tuffy sling made for the type of load you're handling and (1) specify name — Tuffy; (2) specify type (U-1, U-2, etc.,); (3) specify diameter and length of fabric wanted. Special fittings are equally easy to order.

Tuffy Hoist Line Teams Up with Tuffy Slings

Tuffy Hoist Line is a special rope construction for hoisting on all types of over-head, stiff leg and mobile cranes, derricks and clamshells. Use it with Tuffy slings for a perfect working pair.

union Wire Rope **corp.**

2224 Manchester Avenue, Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

MY NAME _____ TITLE _____

COMPANY NAME _____

ADDRESS _____

2. CITY _____ ZONE _____ STATE _____

ACCIDENT INSURANCE
is the Best Policy!

CASTEEL WB2H

Safety WHEEL BLOCKS

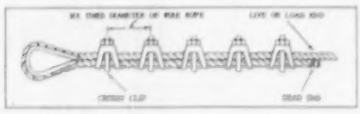
—*provide positive protection* for all blocking requirements: trucks, trailers and other heavy wheel loads.

One-piece casting made of high-strength Alloy Steel for maximum durability and minimum weight. Cast-on gripper teeth hold securely on any surface—even on ice or snow.

Easily handled and stored — your name can be cast-on for identification. Your best buy to beat bad weather hazards.

SEND FOR NEW BULLETIN N-57

Calumet Steel Castings Corp.
1636 Summer Street Hammond, Indiana



CROSBY wire rope clips attached correctly. U-bolt of each clip should be on the dead end of the wire.

iron rope. It is used frequently in marine service.

Monel metal is used where rope is exposed to marine atmospheres, acids of a reducing nature (such as sulfuric, muriatic and hydrofluoric), neutral brines, food products, pickling solutions, and aromatic chemicals.

Corrosion-resisting ropes are furnished in complete assemblies and slings with fittings attached. Temperature, humidity, nature and concentration of corroding chemicals should be considered in selecting equipment.

Preformed Wire Rope

A preformed wire rope is one in which each individual strand, and at the same time each individual wire, is permanently formed into the helical shape it will assume in the finished rope. Advantages of preformed rope are:

1. Higher resistance to bending fatigue.
2. Greater flexibility.
3. Less susceptible to kinking and therefore easier to install.
4. More equal distribution of load on each strand and wire.
5. More resistant to whipping and vibration.
6. Hugs small drums better and winds more uniformly and smoothly.
7. Operates over sheaves with less rotation around its axis, with less wear on rope and sheaves.
8. May be socketed with less danger of unbalancing the lay of the rope below the base of the socket.
9. Does not unravel when seizings are removed from ends of rope.
10. When outer wires break through fatigue, they do not protrude or "porcupine." This reduces risk of injury in handling.

Since broken wires are less conspicuous in preformed rope, greater care is needed in inspection. However, broken ends separate slightly, permitting detection.

Strength and other qualities are the same for preformed and non-preformed rope of the same size, grade and construction.

Slings and Fittings

Wire rope slings are widely used for heavy loads. Types of slings are grommet, single leg, two-leg bridle, 3-leg bridle, 4-leg bridle.

Legs can be single-rope, double-rope, grommet, braided single or braided double.

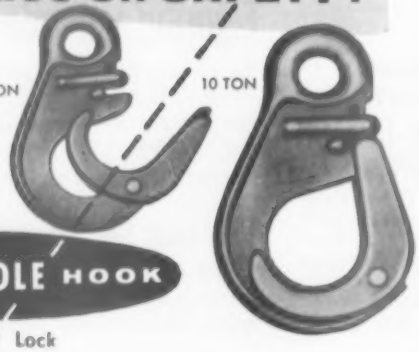
Load-end fittings can be loops, links, hooks, chokers, sockets, shackles, equalizing thimbles, slip-through thimbles, plate clamps, or special.

Safety hooks on cranes, hoists and other lifting equipment prevent the load from jarring loose from the hook until the hook is unlocked manually. The latch also acts as a gauge to indicate whether the hook is sprung or not.

Complete assemblies can be obtained from manufacturers who

What Value
do you place on SAFETY?

How safe is it?
Check these Safety Features on the Walpole Positive-Lock Safety Hook against any other hook.



THE WALPOLE HOOK
Positive Lock

1. A true safety design . . . not a snap hook.
2. Completely encloses the sling and will not open under load.
3. Drop-forged of chrome nickel steel and finished in bright cadmium.
4. Available in 3-ton and 10-ton ratings and designed with a safety factor of Four.

IMMEDIATE SHIPMENT

Available through your local distributor or

THE WALPOLE COMPANY
DEPT. 105 100 BOYLSTON STREET BOSTON 16, MASS.

should be consulted when slings are to be used for special purposes.

Maximum strength is obtained when all legs of the sling are vertical. The smaller the angle formed between the legs of the sling and the horizontal, the greater the tension on the legs and the less weight which can be lifted.

Where a load has sharp corners, pads or sling saddles should be placed between load and sling. Where there are sharp bends over an unyielding surface, tension on outside strands may injure the rope.

Causes of Failure

When wire rope fails to give expected service, the reason is seldom a defect in construction of the rope. Here are some of the more common causes:

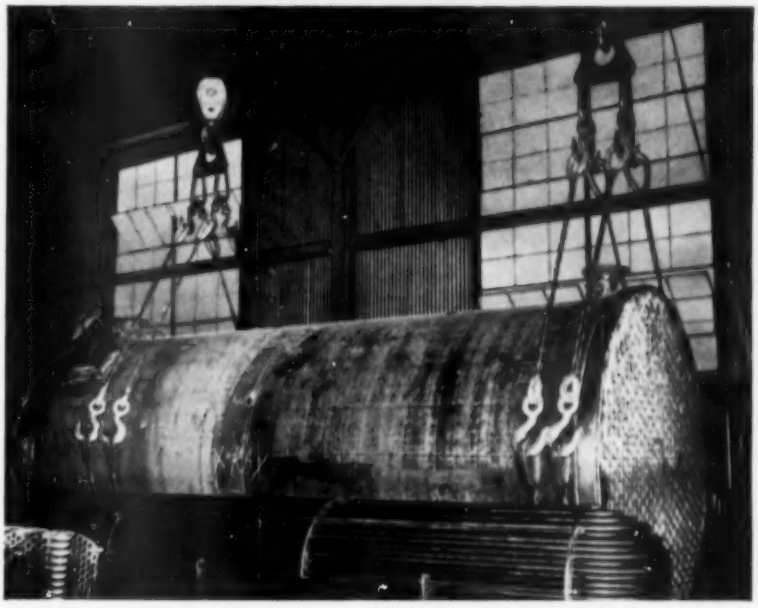
1. Use of rope of incorrect size, construction or grade.
2. Allowing rope to drag over obstacles.
3. Lack of proper lubrication.
4. Sheaves and drums of inadequate size, causing short radius bends.
5. Overwinding or cross winding on drums.
6. Sheaves and drums defective or out of alignment.
7. Ropes jumping sheave flanges.
8. Effect of heat, moisture, or acid fumes.
9. Improper fittings.
10. Permitting ropes to untwist.
11. Kinking.
12. Severe overloads, reverse bends, and other excessive stresses.
13. Internal wear caused by grit penetrating between strands and wires.

How to Order

When ordering wire rope, the following information should be furnished:

1. Length.
2. Diameter.
3. Construction—Number of strands; number of wires per strand; arrangement of wires in strand, such as Seale, Filler Wire, etc.
4. Type of Fabrication—If preformed rope is desired, it should be specified. Otherwise, nonpreformed rope will be furnished.

are your slings safe?



This 24-ton heat exchanger, made by the Texas Metal Fabricating Company, is shown being lifted by Wickwire 3/8" Multiflex Type 1 Single Leg Slings—one of many types of Wickwire Slings which are serving American industry today.

One faulty sling can play havoc with your crews, your equipment, the materials they handle and your pocketbook. That's why it is so important for you to make absolutely sure of the quality of the slings you use . . . why we believe that Wickwire Slings are your safest buy.

You see, we control the quality of the steel that goes into Wickwire Slings by carefully making our own. From this steel, we make our own rods and, from these rods, our own wire. Then, our own wire rope. And, finally, we make our own wire rope into Wickwire Slings. Every step is handled right in our own plants. *This enables us to completely test our product throughout every stage of its production . . . and it's your assurance of the safest sling possible.*

It's a mighty good reason why SAFETY DEMANDS THAT YOU GET THE WICKWIRE STORY TODAY. For complete details, contact the nearest sales office listed below.

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WIRE ROPE SLINGS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
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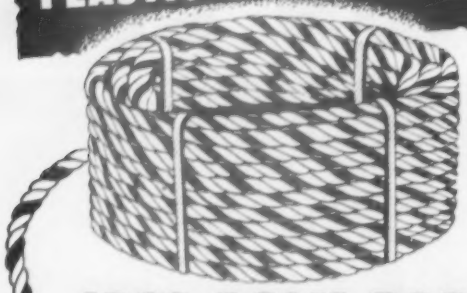
PLASTIC BARRIER ROPE



IPCO POLY-ROPE®

Triple strand rope of polyethylene plastic; two strands of yellow, one of black. Immediately identifies a restricted area in that it carries out the standard CAUTION colors. Tensile strength over 1200 pounds. No sag or stretch. Durability for long service life. Used and recommended by all types of industry.

WRITE FOR BULLETIN NO. 93

IPCO
Safety Equipment for all Industries
INDUSTRIAL PRODUCTS COMPANY
2850 N. FOURTH STREET • PHILADELPHIA 33, PA.

You Can Rely on NEWCO FITTINGS

NEWCO SAFETY HOOK
Positive locking when load is applied. To be opened, hook must be manually pressed against a compression spring. Drop forged hook, manganese bronze alloy yoke (110,000 P.S.I.). Sizes rated 1,600 lbs. to 10,000 lbs. Pat. Pending.

NEWCO BOOM PENDANT THIMBLES
Cuts maintenance costs—dampens vibration—increases fatigue resistance. High quality electric steel castings. As an expedient, the fittings can be applied in the field with standard wire rope clips. Pat. Pending.

NEWCO CLAMP and THIMBLE
85% to 95% of catalog list of wire rope strength. Thimble will not collapse—affords maximum protection for wire rope. Anyone can install it—can't go on wrong. United States Patent Number 2,600,417.

OTHER NEWCO FITTINGS: Slip-on Thimbles—Bridles—Saddles—Choker Hooks—Pipe Hooks—Load Protectors

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NEWCO manufacturing co., inc.
3636 Main Street • Kansas City 11, Missouri

5. Finish—Galvanized finish should be specified if required. Otherwise bright rope is usually furnished.

6. Grade—Improved plow steel, plow steel, iron.

7. Lay—Regular lay right lay will be furnished unless otherwise specified. Lang lay or left lay is furnished on request.

8. Core—Specify fiber core, independent wire rope core, or wire strand core.

9. Lubrication—Type of lubricant should not be specified unless there are unusual service requirements. Each construction and grade of rope is treated with a lubricant adapted to that particular rope for a wide range of service conditions.

10. Use for which rope is intended.

Wire Rope Lubrication

All wire rope should be treated at regular intervals with a lubricant to keep it pliable and to prevent rust. Pound for pound, wire rope probably has more bearing surface (inside the rope) than any other equipment, so the importance of lubricating is obvious.

Idle wire ropes are most susceptible to rust. It is important that they are well lubricated when not in service.

The best lubricants are those furnished by manufacturers and dealers especially for lubricating wire rope.

Lubricants which meet specifications are free from acids and corrosives and have penetrating qualities. They do not cake, gum or ball-up if contaminated with dirt or metal particles.

Lubricant may be applied with a brush. It should be brushed on slowly, carefully and frequently because it is difficult to get complete coverage and penetration.

A more effective method is a simple three-sheave trough. It should be firmly fixed near the reel or drum and the rope run through the lubricant not faster than 30 ft. a minute. * * *

Cleanliness around steam pipes is important. Prevent accumulations of dust, lint and other finely divided material that might ignite.

Bridge Plates

Movable plates for bridging the gap between loading platforms and carriers are needed for both hand and power trucks. Bridge plates are usually of steel or lightweight magnesium or aluminum alloys.

Sides of bridge plates should be turned up at right angles to prevent trucks running over the edge. Handholds facilitate handling.

Bridge plates should have a high friction surface to prevent slipping of vehicles or persons. Plates should be designed so that when in position the ends will have substantial contact with the loading platform and the carrier to prevent rocking or sliding when in use. * * *

Chains

—*From page 194*

strength of the chain. Under full working load they will fail under impact before a fully loaded wrought iron or heat-treated carbon chain will fail.

Wear and impact factors cause some chain manufacturers to recommend that link size of sling chains should not be greatly reduced when using high-strength alloy steel chains as compared with wrought iron chain. Longer life and increased safety justify increased cost.

Storage. When not in use, each chain should be hung on a rack or piled neatly on a dry floor or platform where it will not create a tripping hazard. Exposure to corrosive fumes or liquids should be avoided.

Safe loads. Some plants stamp on a metal tag attached to each chain the safe vertical load which may be lifted with the chain. A better way is to stamp the safe load, or a reference number, on the ring or hook. Stamp marks should not be placed on links where they might form points of weakness.

The useful life of all material-handling equipment, particularly rope and chain, is shortened by overloading, jerking and neglect of maintenance.

"What's that, Fred? You say my work overalls were exposed to atomic radiation today, and be sure not to touch them until they've been decontaminated?"

Chain Slings

Preferably, slings should be purchased complete from the manufacturer. All attachments should be made to proper dimensions and of material specified for various uses.

When a sling requires repair, it should be sent to the manufacturer.

Rings and hooks are as important as the chain and should receive the same attention in inspection and maintenance.

A hook bent by overloading should be replaced. The stress of bending weakens metal so that its strength cannot be restored by repairing. * * *

Basic Equipment

FOR MOVING large quantities of materials in more or less continuous flow in fixed paths, conveyors, traveling cranes, railroads, and elevators are used.

Trucks, tractors, and trailers are better for moving goods intermittently between many points in plant and yard, without regard to fixed limits.

Portable types of equipment are needed in every plant. In the smaller establishments they serve all handling needs. In the larger industries they are useful auxiliaries to fixed systems.

You're SAFER
—time and money ahead
with— TM
factory made
ALLOY SLINGS!

TAYLOR uses
GAMMA RAY
QUALITY CONTROL
on master, joiner and end links...

CONTROLLED-ATMOSPHERE HEAT-TREATING
on popular chain sizes

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TAYCO HOOKS!
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Famous TM factory made Alloy Sling Chains are tougher—and safer! The use of Gamma Ray assures flawless, trouble-free welds on master, joiner and end links. This, in addition to our rigid standards...Controlled-Atmosphere Heat-Treating of popular sizes... patented Tayco Hooks and other superior production techniques, makes TM factory made Alloy Slings a better buy!

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TAYLOR MADE
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YOUR BEST MOVE . . . MOVE
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MATERIAL
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For Interesting Information write
MERRILL BROTHERS
56-28 Arnold Ave., Maspeth, N. Y.

This discussion will be concerned chiefly with portable equipment in common use, including:

1. Wheelbarrows.
2. Hand trucks.
3. Hand lift trucks.
4. Powered hand trucks.
5. Industrial power trucks.
6. Hoists.
7. Cranes.
8. Conveyors.
9. Slings and accessories—wire rope, chains, fiber rope.
10. Miscellaneous equipment—skids, pallets, steel strapping, grabs, tote boxes, bridge plates, dollies, etc.

Load-Bearing Parts

Wire rope, chain and fiber rope are important wherever loads are lifted or hauled. These products are built to meet exacting specifications and their capacities are listed according to size, material and type of construction.

Slings made of these materials, and attachments, such as hooks, rings, etc., are designed to meet the needs of every hoisting job.

These parts are subjected regularly to heavy loads, sometimes overloads. They should be selected for the needs of the job and kept serviceable by regular inspection and maintenance.

Unit Loading

Assembly of loads on skids, pallets or trailers to be moved from one part of the plant to another means less handling and more pieces per each handling. To move the load, it is only necessary for the truck to slide the platform or fork under the skid or pallet or to hook a tractor to the trailer.

A skid is a platform elevated from the floor by legs, casters or special attachments.

A pallet is a development of the platform skid. The most common type is the double-faced wooden pallet with sufficient clearance between top and bottom to insert the forks of a fork truck for moving.

Clamps of various types add to the usefulness of fork trucks. These can move and pile drums, bales and cartons without use of pallets.

Steel strapping provides a secure method of fastening some types of bundled materials for shipping and for reinforcing packing cases. Workers need training in application and removal and should wear goggles and leather palm gloves for the work. Equipment available from suppliers should be used for applying and removing strapping. * * *

Renting Equipment

Many items of material-handling equipment are available from manufacturers on lease as well as through purchase. These include: fork trucks and tractors, portable elevators, cranes, storage racks, and certain special types of equipment.

The only thing that can cheat some people out of the last word is an echo.

NEVER SLIP CLAMPS
Hold their own for SIMPLICITY of OPERATION, STRENGTH, SPEED, BUT MOST OF ALL FOR SAFETY!
HORIZONTAL
VERTICAL
Operators the world over prefer NEVER - SLIP clamps because:
• There are no enclosed parts.
• Clamps adjust automatically by strong cam action to any plate thickness.
• The heavier the load, the harder the grip.
• Holding surfaces are hardened and serrated for longer wear and efficiency.
"For Better Materials Handling"
NEVER-SLIP SAFETY CLAMP DIVISION
KENSICO Manufacturing Co., Inc.
RAILROAD AVE. MT. KISCO, N.Y.

IN THIS SECTION

Guarding the Machine 208
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Lubrication 222

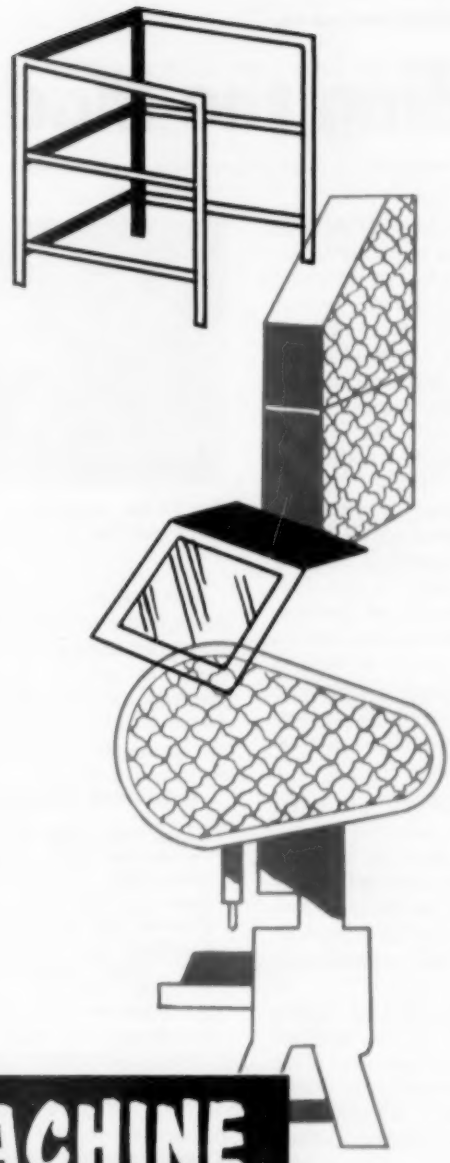
• • •

MACHINE GUARDING has progressed far beyond the original idea of adding something to a machine to cover the moving parts. Newer models have a high degree of built-in safety with danger points enclosed, automatic pressure lubrication, push-button controls, and functional application of color.

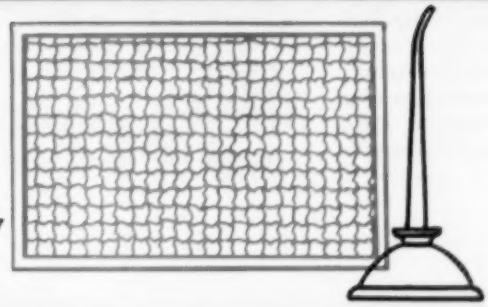
Not all machines, of course, can be guarded completely by the manufacturer. There are many older models still in operation and even with new equipment special production problems may require guards made to order.

Modern guarding takes into consideration the operator as well as the machine and regards the problem as still unsolved if output is seriously reduced.

Involved in the broader problem of safeguarding are the electric power that keeps the machinery operating and the hand and portable power tools that supplement machine operations and keep the plant and its equipment in safe condition.



8 MACHINE OPERATION and GUARDING



Guarding the Machine

THE MODERN MACHINE, in contrast with some of its predecessors, presents a trim, streamlined appearance and much greater safety. Gone are the overhead belts and shafting, replaced by individual motor drive. Pressure lubrication reaches remote bearings without exposing the oiler to hazard or shutting down the machine.

The machine's point of operation, however, still presents a problem. Few operations now require the operator's hands in the danger zone but they do get there at times and machinery still ranks high among the causes of serious injuries. Guarding, therefore, must protect the individual against his own lapses as well as against normal hazards.

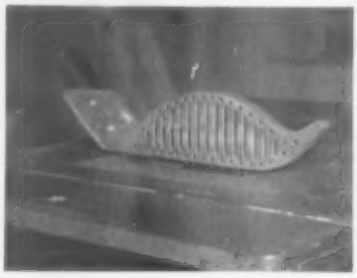
Color is an important safeguard. Highlighting the point of operation with light tints in contrast to the darker background of the machine reduces the effort of seeing. Guards painted in high-visibility colors are also conspicuous when missing.

Standard guards for many types of machines are on the market. These are often installed on older machines, on newer ones where built-in guards have not been provided, or where specially made guards are needed. For power presses, circular saws, and other machines, many types of guards are available.

A guard should not restrict production seriously. If it does, it will not be popular with either operator or management. Study of the problem by all persons concerned will often result in a satisfactory guard.

Some operations can be guarded effectively with available commercial guards. Others require custom-built guards developed through study of the job by both operating and safety departments.

Machines involved frequently in accidents include woodworking machines such as circular saws, jointers and planers, and power presses.



CIRCULAR SAW guard. Splitter and kick-bag dogs in operating position.

The majority of machine accidents occur at the point of operation—the area or point on a machine at which work such as forming or cutting is performed.

References—Machine Guards

National Safety Council: Accident Prevention Manual for Industrial Operations, 1955.

—Inspection and Maintenance of Power Presses; Data Sheet D-224.

—Individual Die Guards and Adjustable Press Barriers; Data Sheet D-Me-27.

—Press Brakes; Data Sheet D-Me-28.

—The Radial Saw; Data Sheet D-353. (See complete list of Data Sheets for information on guarding various types of machines.)

National Safety News: Punch Presses Can Be Guarded; R. F. Thuma, Jan. 1950.

—Taming the Saw; L. H. Reineke, July 1950.

—Radioactive Press Guards; James H. Leacock, Aug. 1953.

—Electronics in Plant Operation; W. A. Black, Jan. 1954.

—Build Them Yourself; F. P. Hutchinson, Feb. 1955.

—The Modern Approach to Machine Guarding; George W. Bowen, Jan. 1956.

—Analyze the Job for Effective Guarding; Anders V. Thoren, Nov. 1956.

American Standards Assn.: Mechanical Power Transmission Apparatus, Safety Code for; B15-1953.

—Compressed Air Machinery and Equipment, Safety Code for; B19-1938.

—Power Presses and Foot and Hand Presses, Safety Code for; B11.1-1948.

—Woodworking Machinery, Safety Code for; O1.1-1954.

Individual motor drives for machinery have eliminated much hazardous power-transmission equipment and improved lighting and housekeeping.

Guard design must often be approved by state factory inspectors and insurance engineers. Since state codes are not uniform and at best represent only minimum requirements, codes and recommendations of the American Standards Association are the best guides.

Point of Operation

Guarding the point of operation effectively is usually more complicated than enclosing power-transmission apparatus.

Point-of-operation guards are installed at those parts of machines where cutting, shaping or forming is performed, and at other points potentially hazardous to operators inserting or manipulating stock.

Guards should protect operators both from moving machine parts and from moving materials. Safeguards are of these types:

1. Automatic feeding and ejecting.
2. Two-hand control.
3. Redesign of machine parts so that the operator cannot get into the danger zone.
4. Devices that interrupt movement of tools or machines while any part of the body is in the danger zone.
5. Devices that pull or push hands away from the danger zone.
6. Barricades, covers, hood guards and other enclosures.
7. Interlocking devices.

Hood enclosure and cover guards are used on woodworking machines and other types of equipment. Frequently, such guards are automatic. Others are of rigid construction.

Nip hazards, such as rubber mills, calender rolls, dough breaks, and others, can be protected by sensitively adjusted controls that operate dynamic brakes when contacted by any part of the operator's body. These guards stop the machine quickly.

Two-hand controls frequently are installed on power presses,

bakery machinery, guillotine paper cutters and other types of equipment where barrier guards are not practicable.

Interlocking devices prevent operation of the starting control when the cover or barricade is not in place. These are used on centrifugal extractors, dough mixers, tumblers and some types of pressure vessels.

Power Presses

Safeguarding power-press operations is one of industry's major accident-prevention problems. Because of the many types of presses and specialized operations performed, the subject is highly complicated. Material on press operation is available from National Safety Council, American Standards Association, U. S. Department of Labor, insurance companies and other sources.

Automatic feed makes it unnecessary, but not impossible, for an operator to place his hand between punch and die. It is still necessary to provide a gate guard, enclose the ram, or limit its stroke to ¼ in. or less.

For some operations, semiautomatic feeds are used. Principal types are: chute, plunger, slide or push, sliding dies, dial and revolving dies.

Two commercial guards adaptable to many operations are the sweep and pull-back types.

Sweep guards are best used on small presses. They are easily adjusted and give the same protection when the clutch fails as they do for a regular stroke of the press.

A flag of fiber or other material placed on the sweep arm helps to prevent an operator reaching around the guard on one side, and on slow-moving presses, from putting his hand between punch and die after the guard has swept past the center of the stroke.

Sweep guards are not effective on large presses.

Pull-back guards forcibly remove the operator's hands from the point of operation if he is out of rhythm with the machine. Cables connect the ram with wristlets on the operator's arms. As the ram descends, the hands are forcibly withdrawn.

The guard must be adjusted to each operator and each job because of variations in arms, hands and fingers.

Die design. On punch and forming presses it is frequently necessary to install guards of a different type for each set of dies used. For this reason, enclosure guards should always be considered integral parts of the dies.

Feeding tools. Several types of feeding tools are used on presses with automatic feeds or enclosed guards. These tools are made of soft metal, aluminum or magnesium. They include pushers, pickers, pliers, tweezers, forks and suction disks.

These tools are not substitutes for guards and should be used only in conjunction with two-hand trips or pull-back guards.

Photoelectric guards. The photoelectric relay consists of a beam of light. When this is broken by the press operator's hands, the start or completion of the ram stroke is prevented. The photoelectric relay responds instantaneously, is automatic, takes up little space, is easily installed and economical to maintain. Against these advantages are comparatively high installation cost and limited uses.

On presses with friction clutches, the ram travel stops immediately when the light beam is broken. This method is not effective on presses with positive clutches because the ram will continue its stroke until the end of its cycle. The guard should be operated from a closed electric circuit so that current interruption will automatically prevent the press from tripping.

Radioactive guards have been used on some power-press operations. The operator wears radioactive wrist bands. When his hands are in the protected area, the radioactive units are detected by Geiger tubes, and the press

MATERIALS FOR MACHINE GUARDING

Material	Clearance from moving part at all points	Largest mesh opening allowable	Minimum gauge (U. S. Standard)
Woven wire	Under 4 in.	½ in.	No. 16
	4-15 in.	2 in.	No. 12
Expanded metal	Under 4 in.	½ in.	No. 18
	4-15 in.	2 in.	No. 13
Perforated metal	Under 4 in.	½ in.	No. 20
	4-15 in.	2 in.	No. 14
Sheet metal	Under 4 in.	.....	No. 22
	4-15 in.	.....	No. 22
Wood or metal strip crossed	Under 4 in.	½ in.	Wood ¾ in., metal No. 16
	4-15 in.	2 in.	Wood ¾ in., metal No. 16
Wood or metal strip not crossed	Under 4 in.	½-in. width	Wood ¾ in., metal No. 16
	Under 4 in.	1-in. width	Wood ¾ in., metal No. 16
Solid wood	If plywood is used it should be not less than ⅜ in. thick and not less than 3 ply.		

will not operate. Radioactive materials are within safe limits.

Power Transmission

Power transmission apparatus includes shafting, belting, pulleys, gears, starting and stopping devices, and other moving parts of equipment used in the mechanical transmission of power. Also included are prime movers, intermediate equipment, and other machines.

Power transmission parts, particularly in modern installations, contribute relatively few injuries. Nevertheless they can cause permanent disabling injuries and should not be neglected.

Individual motor drives and modern designs with moving parts enclosed have eliminated much guarding on the job. However, some guards still must be added when machines are installed.

Materials for Guards

Sheet metal, perforated metal, expanded metal, heavy wire mesh or **bar stock** may be used for most types of guards.

Transparent plastic is used where inspection of moving parts is necessary and the strength of metal is not needed.

Shatter-proof glass is used in similar situations, particularly where illumination of guarded parts is essential and the flexibility of plastic is not required.

Where flying particles may mar safety glass or plastic the surface may be protected by replaceable glass covers.

Wooden guards are relatively low in strength but are sometimes used where splashes and fumes from corrosive substances would attack iron or steel.

Aluminum or other soft metals may be used where resistance to rust is essential, or where machinery may be damaged by iron or steel.

Supervision. Frequent checks should be made to see that instructions are observed and that safety devices are functioning.

Operators occasionally make safety devices ineffective in an attempt to speed up production or make operation easier. This is especially frequent with two-hand controls. Operators should be warned of the hazards involved and instructed in the use of safety devices.

MECHANICAL APPARATUS INSPECTION

Check the points listed below. Make recommendations to cover unsatisfactory conditions so that they can be corrected promptly.

POWER TRANSMISSION ENCLOSURES OR GUARD RAILS	OK
Pulleys, flywheels	☐
Gears, sprockets, chains	☐
Belts: vertical, horizontal	☐
overhead horizontal	☐
Belt shifters	☐
Keys, setscrews, collars, couplings	☐
Shafting	☐
Clutches	☐
Lubrication facilities	☐
CONTROLS	
Electrical starting devices	☐
Lockout devices	☐
Tripping devices: foot, hand	☐
POINT OF OPERATION GUARDS	
In place	☐
Condition satisfactory	☐
Correct adjustment	☐

SAFETY INSTRUCTION CARD No. 778

Circular Saw

The circular saw is one of the most useful of woodworking power tools—and the most dangerous. It causes more permanent disabilities than any other machine in the industry.

Rim speed of a circular saw should not exceed 12,000 fpm, unless the saw has been manufactured or hammered for a higher speed and is so marked. When turning at high speed the teeth are almost invisible.

Following are important points in guarding:

1. Saw must be equipped with a hood that will cover it to at least the depth of the teeth.

2. Hood must automatically adjust itself to thickness of material being cut and remain in contact with it, unless in a fixed position. Then space between bottom of guard and material must be no more than ½ in.

3. Exposed parts of saw blade under table must be guarded.

4. There should be a clear view of saw at point of operation.

5. Guards should be designed and constructed to avoid vibration.

6. All teeth should be even in length.

7. Blade should not be lumpy or warped.

8. Depth, size and shape of gullets should be such as to let sawdust discharge freely. Bottom of the gullet should be round.

9. Cut in wood should be a trifle wider than thickness of saw blade.

10. Saw must be discarded if it has a crack longer than 5 per cent of diameter, unless diameter is reduced to eliminate crack and tension is corrected.

"No! No! That's not the way to test the fire extinguishers!"

Swing Cut-Off Saws

1. Swing cut-off saws must have device to return saw automatically to back of table when released at any point. Fiber rope or cord must not be used in device.

2. Limit chains, positive stops or table extensions must be provided to prevent saw from swinging beyond front edge of table.

3. Where it is possible to pass behind a swing cut-out saw, rear of saw must be completely housed when saw is in back position. Housing must include swing frame as well as saw.

Manual-Feed Ripsaw

1. A splitter or spreader must be provided to prevent pinching or binding. It must be slightly thinner than the saw kerf and slightly thicker than the saw disc.

2. Antikickback devices of steel should be designed and installed so as to be effective for material of all thicknesses. * * *

Schrader PILOT VALVES like the one above, and the one indicated by the red arrow, are used for remote control of air systems. Here, three are used to control the dip hopper air system. Schrader makes hundreds of air products to fit the needs of any operation. A few are indicated by red numbers, 1 through 7.

How Schrader Air Products help give

3 baths to plated parts—automatically, safely!

Dipping baskets of plated parts in three successive baths was a monotonous, slow job at this plating company in New Haven, Connecticut. Then the operation was automated with Schrader Air Products. The dip hoppers now operate as if by magic—alone. Completion of one sequence automatically starts another. Just one more example of air at work in industry.

There is no limit to what air can do, except man's own imagination. Every day new operations are being performed with air. Its economy, efficiency and safety make it a natural for the world of tomorrow.

But *you* can get started today. Schrader engineering facilities are available upon request, to assist you in planning for the best use of air in your plant. Send for the latest informative booklets which show Schrader Air Products that can help you produce more economically.

Schrader®
ESTABLISHED IN 1844

A. SCHRADER'S SON
Division of Scovill Manufacturing Company, Incorporated
452 Vanderbilt Avenue, Brooklyn 38, N. Y.

FIRST NAME IN THE USE OF AIR
FOR INDUSTRIAL PRODUCTION AND CONTROL

Electrical Equipment

ELECTRICITY keeps the wheels of modern industry turning, banishes darkness and speeds transportation and communication. It has made factories cleaner, safer and vastly more efficient. Civilization's demands for power will continue to grow.

Motors for individual machines or groups of machines have eliminated shafting belts and other transmission equipment from most plants, with conspicuous improvement in light, ventilation and housekeeping.

This useful force serves man with a high degree of safety. It can be controlled through modern utilization and protective equipment, but safety requires constant vigilance and careful maintenance of all apparatus.

Rules for use of electric equipment are given in numerous publications, including the *National Electrical Safety Code*, which deals with prevention of injuries, and the *National Electrical Code*, which deals with fire protection.

Electrical equipment which bears the approval label of a recognized testing laboratory has passed exacting tests and can be used with confidence.

Installation. All electrical work should comply with applicable codes.

Transformers, control boards, starting rheostats and other apparatus shoud be placed where there is the least danger of accidental contact with energized conductors. All exposed current-carrying parts should be further protected by enclosures, railings or special guards.

Motors should be mounted so they won't interfere with normal plant traffic. Nonenclosed-type motors should be located in areas relatively free from dust, moisture or corrosive vapors.

Isolating equipment. Transformers, control boards and other accessories should be placed in special rooms to which only authorized persons have access.

If a separate room is not feasible, enclosures should be built around equipment having exposed conductors. Metal enclosures should be effectively grounded.

Barriers may be used to prevent accidental contact with electrical equipment. Frames may be made of wood, rolled metal shapes, angle iron or pipe. Filler may be of woodstrips, sheet metal, perforated metal, expanded metal, wire mesh or shatter-proof transparent material.

Some protection can be obtained by elevating wires and current-carrying parts at least 8 ft. above any working level to which employees (other than qualified electricians) have access.

Where long metal parts, such as rods, bars and pipes are handled, partial enclosures or barriers should be provided to prevent contact with overhead electrical installations.

Warning signs should be displayed near exposed current-carrying parts, especially high-voltage installations.

Many standard machine-guarding practices apply to electric equipment, but there are certain hazards peculiar to electricity. Particular attention should be given to the *National Electrical Safety Code* and the *National Electrical Code*.

Protective grounding is necessary for exposed non-current-carrying metal parts if the equipment is supplied by means of metal-clad wiring, when installed in a wet location, and when it operates with any terminal at more than 150 volts to ground.

Parts to be grounded include motor frames, cranes, cases of transformers and oil switches, wiring conduit and metal lamp sockets.

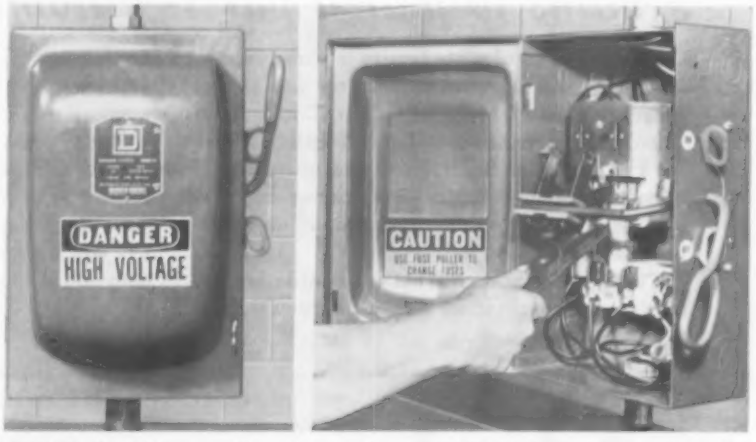
Frames of all portable motors which operate at more than 50 volts to ground should be grounded.

Motors should be of the type and size required for the load and for conditions under which they must operate. Overloading over long periods, use of non-approved motors in areas containing flammable vapors or dusts, and defective wiring should be avoided.

Motor windings should be protected from metal particles, dirt, dust, lint or other material which may damage the windings or become ignited.

In areas containing flammable dust and gases, motors designed for hazardous locations should be installed. The *National Electrical Code* should be followed.

Grounded metal enclosures are recommended for starting rheo-



SWITCH should be in off position and nonconductive fuse pullers used when changing fuses. Self-sticking tape signs remind workers of precautions. Handle can be locked in off position. (W. H. Brady Co.)

Play it safe!

use only
Ampco* Safety Tools
for any job
where fire can occur

When employees must work under unsafe conditions, they tend to do "hurry-up" jobs. That's why you're money ahead when you insist that they use only Ampco Safety Tools in any location where a dangerous hot spark could touch off an inferno.

Ampco Safety Tools are approved by Factory Mutual Laboratories and other safety authorities, for use wherever there are dangerous, inflammable liquids, gases, dusts, or vapors — wherever one slip of a tool could start a disaster.

Play it safe. Select your safety tools from the Ampco line — the world's largest with more than 400 items. Order Ampco today for all your hazardous jobs.

How to choose Safety Tools

For tools subject to impact and/or torque — specify Ampco Metal.

For tools that have cutting edges or gripping teeth — specify Ampco Beryllium Copper Tools.

For tools to be used in the vicinity of acetylene or similar gases — Specify Ampco Monel† Tools.

†T. M. International Nickel Co.

AMPCO METAL, INC.

*Reg. U. S. Pat. Off.

T-16

Dept. NS-3
Milwaukee 46, Wisconsin
West Coast Plant,
Burbank, California
In Canada . . .
it's Safety Supply Co.,
Toronto, Ontario

stats, switches, fuse panels and other operating accessories.

In some devices, both switch and fuses are enclosed in a cabinet arranged so the switch can be operated without opening the cabinet. The switch is interlocked through a cam so that fuses are inaccessible until the switch is opened.

Another type of enclosed switch permits the door of the cabinet to be opened with a key, even though the switch is closed. With either type cabinet, it is possible to padlock the door open or closed, and the switch can be padlocked in the open position.

Maintenance precautions. When repair work is being done on motors, controlling devices or the machinery they drive, the circuit should be de-energized by opening necessary switches and locking them in the open position.

If a switch cannot be locked open, it should be blocked and a tag attached showing that the switch is to be closed only by the man whose name appears on the tag. Warning signs should be displayed.

Wiring depends on type of building construction, size and distribution of electrical load, exposure to dampness or corrosive vapors, location of equipment and other factors. For most plant conditions, rigid metal conduit, effectively grounded, is preferred.

Other methods which may be used under certain circumstances include armored cable, non-metallic sheathed cable, flexible metal conduit (BX), raceways, and open wiring on insulators. National and local wiring codes should be followed.

Cords, Sockets, Lamps

Extension cords should be of a type listed by Underwriters' Laboratories and labeled to show compliance with all requirements of the *National Electrical Code*. They should be inspected regularly. Kinking or excessive bending of cords should be avoided.

Ordinary lamp cord should not be used where it will be exposed to mechanical wear or to moisture—never for extension lamps in boilers, tanks, or on damp or metal floors.

HIGH-VOLTAGE rectifier does not depend on the sign alone for safety. The door is padlocked and a ground stick must be used when working in the cage.

Cord for portable tools and equipment is made in several grades. Rubber-sheathed cord should never be used with tools and lamps in boilers, tanks and other grounded enclosures.

For heating devices, such as electric irons and water heaters, the cord has an insulating covering containing flame-proofing material such as asbestos fiber. It resists high temperature but not dampness.

Sockets should be of porcelain, non-conducting plastic, or rubber covered. Ungrounded metal-shell sockets are not recommended.

Extension lamps are sometimes used under conditions where a shock of 110 volts might be fatal. Safe cords and lamp holders must be provided and maintained in good condition. Handles should be of non-conducting material and there should be no metallic connection between lamp guard and socket shell.

Miniature voltage. Portable transformers which step the lamp voltage down to 6 volts are frequently used where shock hazard is serious.

Employee training. The safety program should include thorough training of employees who install or operate electrical equipment. In addition to instruction in the hazards of electricity they should be trained in up-to-date first-aid techniques.

Of particular importance is knowledge of the arm-lift, back-pressure method of resuscitation. Distribution employees should also know the pole-top method.

Over-Current Devices

Fuses or **circuit breakers** should be installed in every circuit for protection of both personnel and equipment. These devices open the circuit automatically in the event of excessive current flow caused by accidental ground, short circuit, or overload.

Types of fuses include:

Link fuse, a strip of fusible metal between two terminals of a fuse block. If exposed, it may scatter hot metal when it blows.

Explosion fuse, used in central stations, power houses or on overhead lines. When it blows, the gases generated aid in quenching the arc.

Plug fuse, used on circuits which do not exceed 30 amperes

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MICRO SWITCH . . . FIRST IN PRECISION SWITCHING

How MICRO SWITCH Trip Controls give you MORE PRODUCTION with INCREASED SAFETY

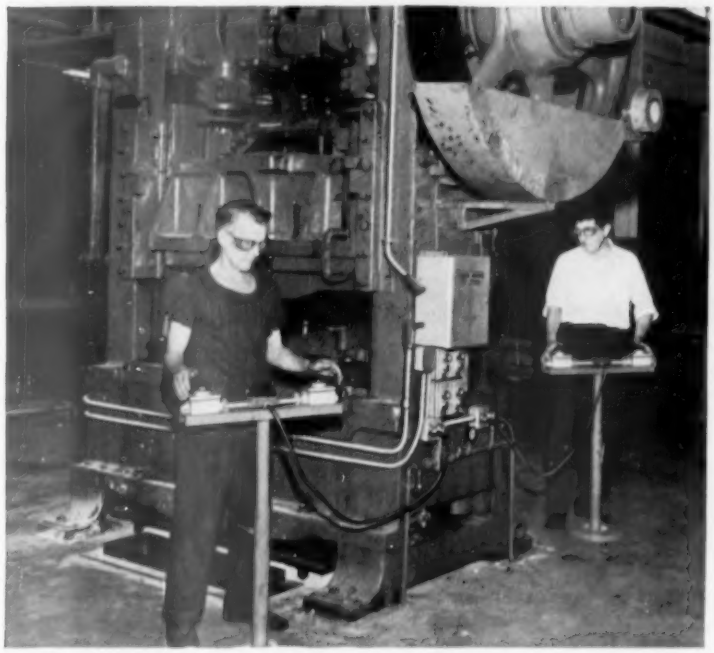


Illustration shows MICRO SWITCH Trip Controls used for multi-operator control of a mechanical clutch machine. Both hands of each operator are required before the press will work.

MICRO SWITCH Trip Controls increase production three ways:

1 They lessen operator fatigue:
Simple, direct operating motions, feather-touch, finger-tip operation of the control switches keep operators fresh and alert throughout the day.

2 They increase operator confidence:
With no worry over personal safety, operators soon develop a smooth, time-saving work sequence.

3 They give instantaneous electrical clutch actuations:
There is no time-consuming "lag" between the time the control is tripped and the machine is actuated. This saves many hours of production time.

Send for Catalog 65 today. Ask for the name of the distributor nearest you.

MICRO SWITCH Trip Controls have wide range of uses

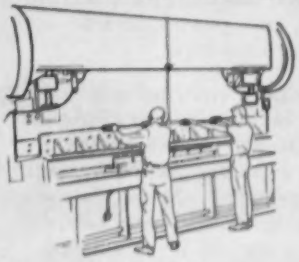
FOR SMALL PRESSES

Provides faster, safer operation with less effort on small two-hand presses, riveting machines, etc.

FOR PAPER CUTTERS

Complete protection is afforded operator in cutting or trimming either flat stock or labels.

ON LARGE PRESSES



Makes operation of large presses and press brakes safe and less tiring. Any number of operator stations may be "wired into" the control circuit.

MICRO SWITCH
A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

at not more than 150 volts to ground. The type which cannot be bridged inside the holder is recommended.

Cartridge fuse, which has a fusible metal strip enclosed in fiber tubes. Available are those which indicate when the fuse is blown and the refillable type in which fusible elements may be replaced.

Insulated fuse pullers, should be kept on hand for pulling and replacing fuses. In installations complying with the code, fuses are protected by a switch which de-energizes the fuses when opened. If the fuse is not protected by a switch, the supply end of the fuse should be pulled out first, and in replacing, the supply end should be inserted last.

Circuit-breakers, used in high voltages or large current capacity circuits and are becoming more common in many kinds of circuits. They may be instantaneous in operation, equipped with timing devices, manually or power operated.

Switches

Types of switches include snap switches, knife switches, enclosed externally operable air-break switches, and oil switches. Those designed for controlling individual motor and machine tools and for lighting and power circuits are of the enclosed type.

Open-knife switches are undesirable because of exposure of live parts and because of the arc formed when the switch is open. Knife switches should be enclosed in grounded metal cabinets having a control level extending through a slot in the cover.

Oil switches have contacts which operate while submerged in oil. They are especially desirable in circuits of 750 volts or more and may be used also in lower voltage circuits.

Snap switches, such as push-button or toggle types, usually have live parts enclosed. Flush switches should be installed in metal boxes, and surface switches used in open wiring and moulding work should be mounted on porcelain or plastic sub-bases. These switches should indicate whether the circuit is open or closed.

Snap switches are preferable to key or pull-chain sockets. Key sockets, if used, should be porcelain, plastic, or other nonconductive material. Pull-chains should contain nonconductive links.

Protection against accidental shock from live electric parts, such as switchboards, fuse panels and control equipment, is obtained by insulating the floor area within reach of live parts.

For low-voltage exposure, dry wood floors without metal parts, or insulating mats, may be used. Mats should be nonconductive and moisture resistant.

Aluminum Wire

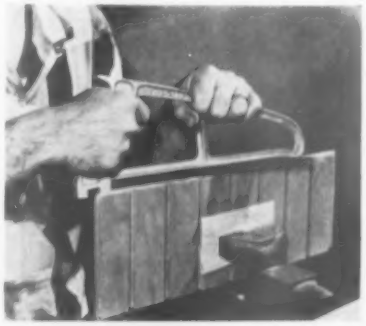
The current-carrying capacity of aluminum wire is 84 per cent of that of copper wire as specified in the 1953 and earlier editions of the *National Electrical Code*. For circuits it has been common practice to use an aluminum conductor two American wire-gauge sizes larger than a copper conductor to comply with the 84 per cent factor given in the code. * * *

Tools—Hand and Power

HAND TOOLS, the craftsmen's companions since the beginning of civilization, are still needed to put the finishing touches on many machine-made products and in construction and maintenance work.

Estimates are that hand tools are involved in from 5 to 15 per cent of disabling occupational injuries and a large but unknown number of minor wounds. Most of these are caused by accidental contact with cutting edges or by severe blows.

Portable power tools have speeded up many jobs and have added hazards of high speed. With electric tools there is also the risk of shock.



HANDLE converts ordinary file into convenient cutting tool which can be used like a plane. (E. V. Nielsen, Inc.)

Types of Tools

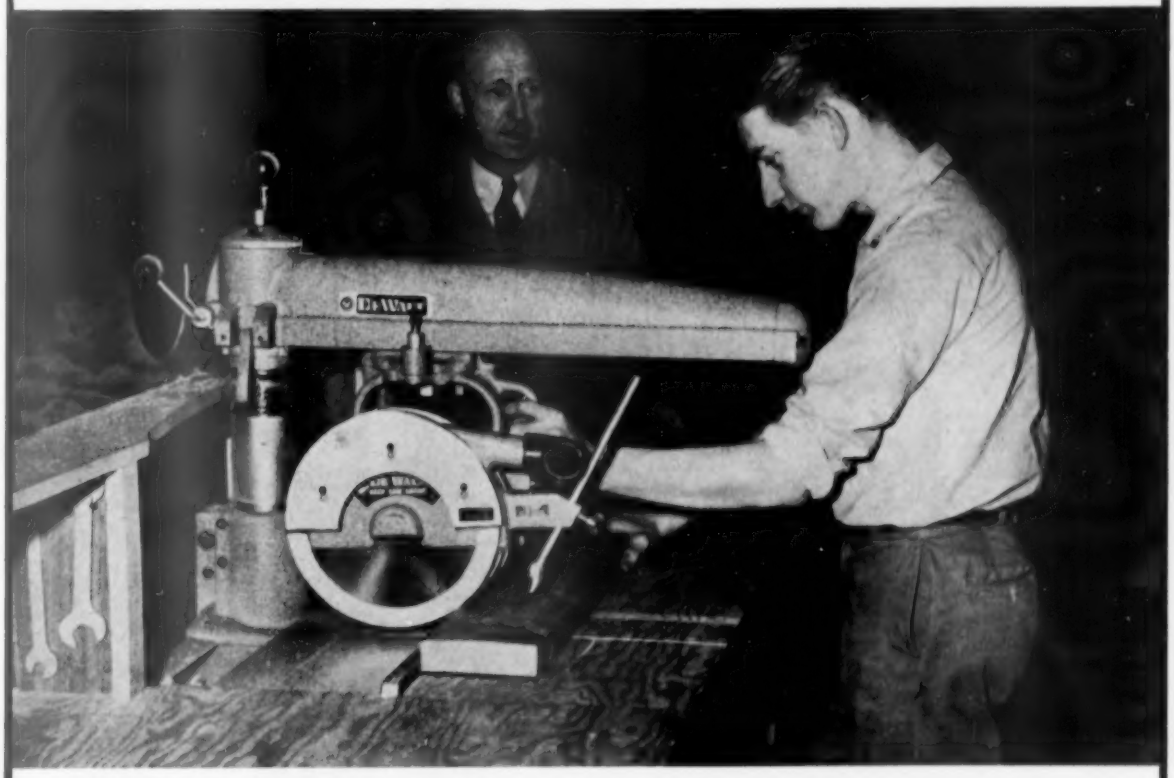
Tools commonly used in industry are of 5 general types:

1. **Metal cutting:** Cold chisels, marking tools, hacksaws, bull chisels, files, tin snips and cutters.
2. **Wood cutting:** Chisels, gouges, saws, axes, adzes, hatchets, knives, brad awls, planes, scrapers, bits and drawknives.
3. **Lifting:** Levers, crowbars, jacks, hooks, shovels.
4. **Torsion:** Wrenches, pipe tongs, screwdrivers, pliers.
5. **Striking:** Hammers, sledges, mauls, picks, punches.

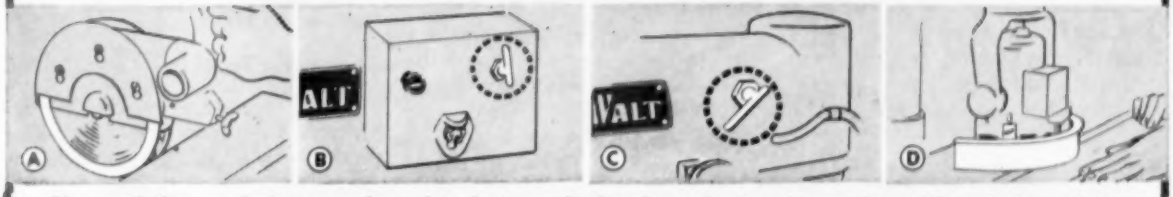
Accident causes. One or more of four causes are primarily responsible for injuries. Following are examples:

1. A wrong or improvised tool—a file or screwdriver for prying; a wrench for hammering.
2. A defective tool — a burred chisel head; a dull saw or knife; a split maul handle; a tool of poor quality.
3. Tools incorrectly used — striking two hard-surface tools together; failing to take practice swing with sledge to adjust for clearance; pulling on pliers in line with face.
4. Tools not put away — wood chisel loosely laid in tool box; hammer left on edge of machine; knife left on table.

Safe cutting starts with a safe saw...



And De Walt® has the safest record in industry!



You need these exclusive operating safety features: **A**—Simpler, safer top-side cutting, with exclusive safety guard. You always see your mark and your saw. **B**—Power brake stops saw in 4 seconds for added safety. **C**—Safety key switch prevents unauthorized use. **D**—De Walt becomes tilting arbor shaper with exclusive safety guard... gives 50% more shapes per cutter. Combines 12 basic power tools, builds into workbench... gives safer straight-line handling.

Do *your* plant cutting with an ***AMF De Walt***—preferred in home, school, and industry for accuracy, versatility ... *and the safest record of performance.* Arm raises, lowers, swings 360°. Motor and saw ride on arm, rotate 360°, tilt downward past 90°. Powerful direct-drive motor accommodates any circular tool, saves cost of separate machines. Enjoy the efficiency *and* safety only a modern De Walt offers.

A wide range of sizes... from 9" to 20", ¾ hp to 10 hp ...for construction, maintenance, crating, pattern shops, production lines—*all* industrial cutting. From just $239 up.

See your supplier or send for FREE BOOKLET.

Another AMF Product
DE WALT POWER TOOLS

De Walt Inc., Dept. NS-703. Lancaster, Pa., Subsidiary of AMERICAN MACHINE & FOUNDRY COMPANY

☐ Please send FREE Booklet on Job-Tested Safety Cutting Methods
☐ Send information on FREE 16mm sound film (23 min.)

Name_____
School_____
Address_____
City_____ Zone____ State_____

Selection. Tools for both routine and special work should be kept in stock or readily available. High-grade tools are the best buy and the difference in initial cost is offset by longer life, reduced upkeep and lessened risk of accident.

Suitable arrangements should be made and responsibility placed for the purchase, handling and care of tools. The purchasing department should be kept informed of tool performance as a guide to future purchases.

Alloy steels combine strength and toughness with light weight which justifies the higher cost for some jobs. Alloys are used for hammers, wrenches, screwdrivers, woodworking tools, pliers, rivet sets, saws, knives and punches.

Some alloys resist mushrooming, and chipping but no tool should be subjected to unnecessarily rough use.

Non-ferrous hammers or mallets should be used for striking tempered or case-hardened tools. These hammers are usually made of copper, lead, bronze, brass, rawhide or wood.

Handles. With hammers, sledges, axes and picks, the greatest strain is where wood and metal join. An adequate supply of good handles should be kept in the toolroom. These should be straight-grained wood free from slivers. Hickory, ash and maple are preferred. Handles should be fitted by an experienced person.

Insulated tools. For working near electric equipment, tools with insulated handles are frequently used. These provide desirable protection but are not a substitute for rubber gloves and other protective devices.

Marking tools. Steel stamps and holders for stamping indentification marks on machine parts and other metal surfaces are available in alloys which resist mushrooming and do not chip readily.

Car movers. For moving cars on rails, car movers which do not slip readily are available. When two men are needed to move a car, two car movers should be used. Ordinary crow bars should not be used.

The Tool Room

Centralized tool control facilitates uniform inspection and maintenance of tools. Protective equipment, such as goggles, can be recommended and issued with the tools.

Centralized control also makes it possible to keep records on tool failure and locate unsafe conditions and unsafe acts. Tools are exposed to less damage than with scattered storage.

A procedure can be set up so that the attendant can send tools in need of repair to a department equipped for reconditioning.

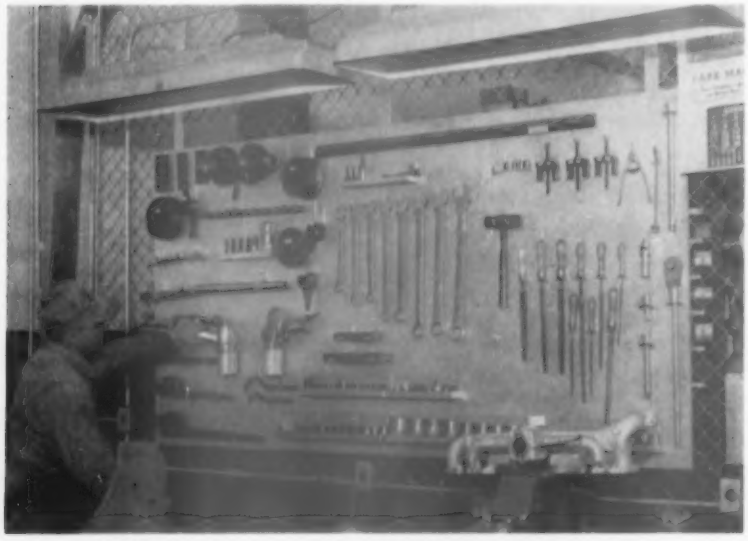
A set of numbered checks can be issued to each employee at the time of employment. These are exchanged for tools at the supply room. By this system the attendant knows where each tool is and can call it in for inspection at regular intervals.

When there are operations at several locations it is not always practicable to maintain a tool supply room. In such cases the foreman should inspect tools frequently and take out of service those found defective. A check list is helpful.

Some workmen provide their own tools. These should receive the same inspection as those owned by the company.

Carrying Tools

Tools should never be carried where they interfere with using both hands while climbing. A



TOOLBOARDS encourage better housekeeping and care of tools.

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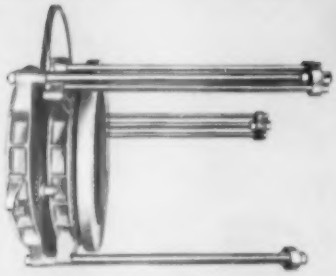


Thermal Expansion Type

Linear expansion of the thermal tubes frees the goggle plate for swinging to open or closed position. The contraction of the tubes clamps the plate, forming a gas-tight seal. Sizes: 36" to 120".

Mechanical Type

Powerful clamping force applied at all points around disc periphery provides a safe seal for gas mains from 6" to 84".

Bailey

GOGGLE VALVES

Bailey Valves assure safety plus efficient service on gas washers, blast furnace mains, precipitators and boiler plants. Bailey Valves operate satisfactorily, regardless of the length of time they may stand unused. Their dependability has been proven thoroughly by hundreds of installations in major steel plants.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

strong bag, bucket, or other container should be used for hoisting or lowering tools.

Chisels, screwdrivers and pointed tools should never be carried edge or point up in the pocket. They should be carried in a tool box or cart, in a carrying belt like those used by electricians and structural steel workers, in pocket tool pouch or in the hand with points and cutting edges away from the body.

Display boards used for maintenance and repair tools encourage return of equipment.

Racks or bins which can be moved to the work area are also useful.

Each workman's tools should be kept in a box or rack convenient to his work area. The box should have designated places for wire brushes, chisels, saws and knives to avoid sharp edges being exposed.

Inspection. Permissible wear limits for tools should be set up as a guide for inspection when they are returned to the crib. Lacking such standards, the attendant or inspector should be qualified to pass on the condition of the tool.

Periodic inspections of tool operations are needed to insure efficient control. Inspections should include housekeeping in the tool crib, tool service, number of tools in the inventory, handling procedure, and condition of tools.

Maintenance and repair require adequate facilities, such as work benches, vises, forge or furnace for hardening and tempering, tempering baths, repair tools, grinders, goggles and adequate lighting. Repairs should be done by trained men.

Non-Sparking Tools

Tools of non-ferrous materials are often used where flammable gases, highly volatile liquids and other explosive substances are used or stored. These tools are made of such metals as aluminum, bronze, brass and beryllium-copper.

Tools made of these alloys include hammers, chisels, punches, prybars, screwdrivers, scrapers, spatulas, picks, and shovels. Special tools of any type can be made to order.

Substances easily ignited include gunpowder, lint, TNT, carbon disulfide and ethyl ether.

Being softer than steel, nonferrous tools are less likely to break off fragments from the metal being worked on by the tool.

With continued use, these tools may become impregnated with particles of foreign substances which may cause sparks if not removed. Frequent inspection is needed.

Non-ferrous alloys are more expensive than steel and special tools are used only where there is an explosion hazard.

Portable Electric Tools

General classifications of hand-operated, power-driven tools are:

1. Abrasive tools, such as disk and portable belt sanders, polishers and bench and flexible shaft grinders.
2. Drills.
3. Saws and other cut-off tools, routers, etc.
4. Assembly tools, such as screwdrivers, nut runners and tappers.
5. Hammers.
6. Sheet-metal shears.
7. Fans.

Portable electric tools are generally designated as:

Light duty, for intermittent use on light work.

Faster, Safer, More Economical and Look—No Wire Waste!

IDEAL®
tie wire reel

Puts wire waste to work!

Yes—IDEAL reel stops costly wire waste. *Actually puts it to work.* Gives 33% more usage per pound of wire, on average. Increases tying speed 25% . . . often much more. Safeguards workers. Discover for yourself how IDEAL reel can speed your tying jobs . . . *safely* . . . and cut job costs, quickly and economically.

You save time—when you change from outmoded wire-tying methods to IDEAL reel. Get 6 to 8 more ties per minute than with clumsy, over-the-head wire coils. No chance for time-consuming tangles, bent or kinked wire. *Saves wire . . . and money, too.*

Write — Wire — Phone — Collect For full details Phone 5-7389

Ideal Reel Company 328 Harahan, Paducah, Ky.

SAVING FINGERS and EQUIPMENT IS OUR BUSINESS!

FOR 10 YEARS WE HAVE SUPPLIED INDUSTRY WITH THE MOST COMPLETE LINE OF ALUMINUM SAFETY PLIERS AND TONGS AVAILABLE.

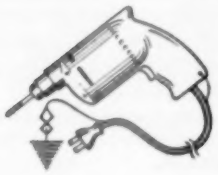
We design and make SPECIALS for your needs.

ASK FOR OUR NEW CATALOG NO. 1056

OSBORN *Manufacturing Corp.*

P.O. BOX 167 WARSAW, INDIANA

PORTABLE ELECTRIC TOOLS



1. Use only equipment that is in good condition. Take good care of it.
2. Be sure the tool is properly grounded.
3. Report the following unsafe conditions:
   Defective or broken insulation on cord.
   Improper or poorly made connections to terminals.
   Broken or otherwise defective plug.
   Loose or broken switch.
   Brushes sparking.
4. Do not overstrain the tool, thus overloading the motor.
5. Never use a portable electric tool in the presence of flammable vapors or gases, unless it is designed for such use.

SAFETY INSTRUCTION CARD No. 91

Special duty, or **standard duty**, for slightly heavy work or fairly continuous operation.

Heavy duty, for continuous operation and production service or for heavy work.

Safety switches, which operate the motor only while the switch is held in the closed position, should be used.

Three possible methods of preventing electric shock to the operator are: (1) Prevent electric contact with the shell; (2) Use non-conductive material for the shell and all parts which the operator may handle; (3) Ground the shell by means of a third wire or central grounding.

Grounding is generally the most practical method of safeguarding against shock. * * *

Protection for Electrical Workers

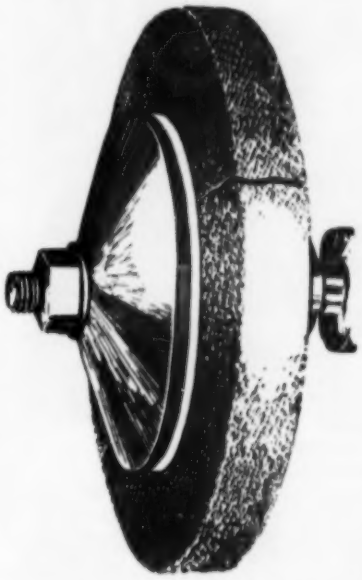
Special tools and protective equipment have been developed for linemen and generating station employees. Operating conditions vary but certain items are standard.

Tools used near energized equipment should be designed for the job and insulated to minimize the danger of shock to the oper-

THE STORY *of the* BROKEN GRINDING WHEEL

A whirling grinding wheel can tell its own story of havoc when it explodes . . . But in this case Perks Safety Washers do the telling!

A test conducted in the Sta-Safe laboratory used the new neoprene faced Perks Safety Washers and an 8" grinding wheel cracked in two places. At 5,000 RPM —an outer surface speed of 12,500 feet per minute— Perks Safety Washers held the wheel intact!



Standard Safety does *not* recommend to you the use of broken grinding wheels—even with Perks—but Standard Safety does recommend Perks Safety Washers as a precaution against possible tragedy in your company. Perks Safety Washers are easily installed on any size grinding wheels. Keep your equipment and personnel safe-guarded. Write now for Bulletin No. 54 containing complete information about Perks Safety Washers.

STANDARD SAFETY EQUIPMENT CO.

232 W. Ontario St., Chicago 10, Illinois

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SEARJEANT *SAFETY* GUARDS for PUNCH PRESSES

Fit any Press

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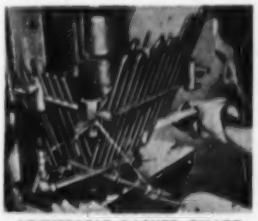

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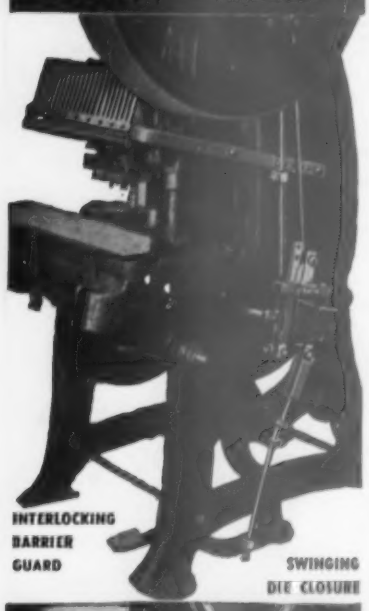
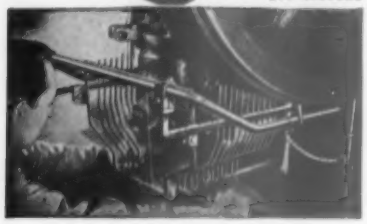
Guards Designed and Made by Searjeant

ADJUSTABLE BASKET • SINGLE SWEEP • DOUBLE SWEEP • END ZONE BARRIER NON-REPEAT MECHANISMS • MILLING MACHINE • FLYWHEEL AND BELT • PUSH BUTTON ELECTRO-SOLENOID OR ELECTRO-PNEUMATIC CONTROLS • ELECTRO-SOLENOID OR ELECTRO-PNEUMATIC DROP GATE GUARDS • PHOTO-ELECTRIC CONTROLS

SEARJEANT METAL PRODUCTS, INC. No. 10, Pittsford Rd., Mendon, N. Y.

JUNKIN
SAFETY GUARDS





Your SUREST Protection Against Press Accidents

JUNKIN safety guards prevent press accidents, afford maximum protection, increase press production, lower insurance costs and generally improve plant morale. Make an investment in safety now and investigate Junkin Safety Guards for primary and secondary punch press operations. Write for free catalog "The Key to Protection".

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SAFETY APPLIANCE CO.
101 S. FLOYD ST.
LOUISVILLE 2, KENTUCKY

ator. Insulation on tools alone, however, is not adequate protection near high voltages.

Items in common use include:

Linemen's rubber gloves
Leather protector gloves
Rubber line hose and blankets
Linemen's belts and safety straps
Climbers
Rubber coats
Tool pouches
Tool buckets
Fuse pullers
Switch sticks
Insulated stools
Switchboard mats

Protective hats of insulating plastic or fiber glass are becoming standard equipment for linemen.

Regular and thorough inspections should be provided for all protective equipment. Defective items should be replaced immediately.

Brooms, brushes and other cleaning equipment used around energized equipment should be free from metal. Insulating handles of tools should be kept clean and dry and only nonconducting preservatives used on them.

Metal ladders should not be used around electrical equipment.

In emergencies where areas are wet, wood platforms, insulated stools should be used or rubber boots should be worn by maintenance workers.

See *Specifications for Rubber Protective Equipment for Electrical Workers*, ASA Series J6.

Lubrication

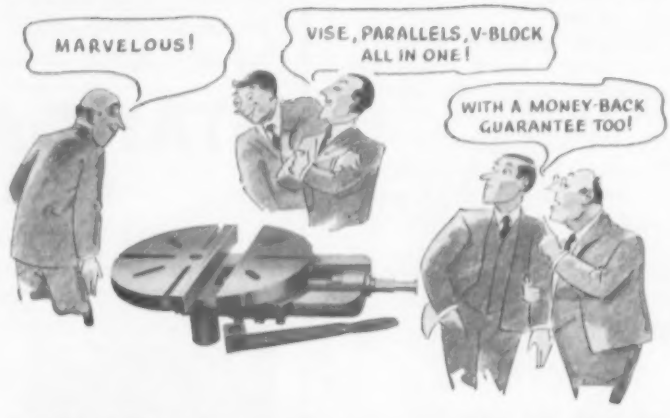
OPERATING at high speeds on countless bearings, modern machines need lubrication at frequent intervals. New lubricants and lubricating systems have been developed to meet these needs. Lubrication has progressed from the oil can to the grease gun and central-pressure systems.

Such an important part of a preventive maintenance program as lubrication should be handled on a definite schedule.

Lack of lubrication results in hot bearings, shutdowns and occasionally fires.

Over-oiling motor bearings

SAVES TIME! SAVES FINGERS!



MODERN Safety Drill Table!

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The handiest, fastest, safest way to make drilling set-ups! Just drop in and drill—all shapes—all sizes. We guarantee it will save its cost in labor alone in six months—to say nothing of the savings from uninterrupted production. We'll put one in your shop for 30 days. Not one penny cost to you if you aren't enthusiastic. Literature on request.

MODERN MACHINE TOOL CO.
2005 LOSEY AVENUE
Jackson, Michigan

causes oil to drop or be thrown on insulation of electrical wiring. Oil deteriorates the insulation, exposing live conductors that will arc and cause fires or electrically charge ungrounded surfaces. Oil on the floor creates slipping and fire hazards.

A survey of plant equipment will determine lubrication requirements. This information should be entered on machinery records.

Commonly used methods are:

1. Capillary oilers
2. Wick oilers
3. Ring and chain oilers
4. Gravity feed oilers
5. Pump feed oilers
6. Cartridge oilers

Some machines have hundreds of remote bearings and these can be served efficiently and economically by centralized systems. Clean oil or grease is supplied under pressure from the central pumping unit to every bearing.

The lubricant is renewed as often as the machine and operation require. This may be once or twice each shift or several times an hour.

On some systems an indicator signals delivery to each bearing of the correct amount of oil.

With a central pressure system there is no need to stop the machine for lubrication. The hazardous job of crawling over machines is eliminated.

Pressure lubrication systems require special greases. Silicone grease, one of the newer lubricants, has shown unusual ability to stand up under high speeds and high temperatures.

For Older Installations

With new machines, efficient lubrication facilities are usually built-in. Older installations, however, were designed for the oil can and it may not be practicable to add an automatic system. In such cases one or more of these methods may be used for reaching remote bearings:

POSSONS SAFETY DEVICES protect your Punch Press Operators

Press Operators Increase Production Safely with Possons Pullback Safety Devices

Latest Improvement
FLOOR LEVEL ADJUSTMENT
Applicable to Punch Presses; Toggle Presses; Embossing Presses and Drop Hammers, as well as special machines.

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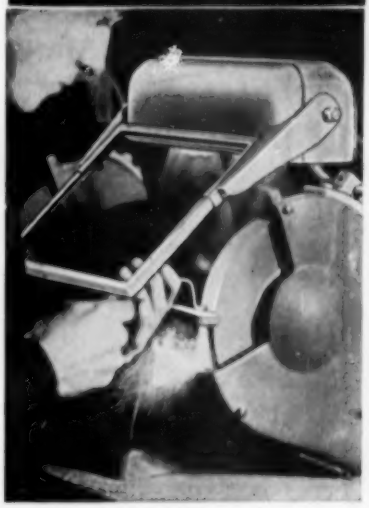
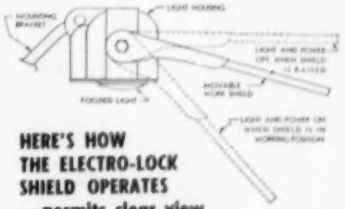
"Canada — Safety Supply Co., Toronto"

JUNKIN ELECTRO-LOCK SHIELD



The Shield Which Commands Operator Safety

The position of the Junkin Electro-Lock Shield is controlled by mercury switches. Interlocking power and light circuits will not permit the machine to operate unless the shatter-proof shield is in a completely protective position. Affords perfect visibility, and protects the operator from flying particles. Write for free bulletin No. 103.



HERE'S HOW THE ELECTRO-LOCK SHIELD OPERATES —permits clear view of work, still providing maximum protection

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Easy on the Fingers!

for holding
★ STEEL STAMPS
★ CHISELS
★ OTHER HAND TOOLS

"Luminum-Line"
ADJUSTABLE
HAND TOOL HOLDER

Keep precious fingers safe from off-angle hammer blows. Just place the hand tool in the holder and hammer away—with greatest possible safety. Three sizes available for tools ¼" to 1¼" square.
Write for Catalog 100

Mecco SAFETY MARKING TOOLS
M.E.CUNNINGHAM CO.
1053 CHATEAU STREET, PITTSBURGH 33, PA.
A Product of the Marking Device Industry

TO BE SURE car wheels won't slip and cause costly derailments and injuries to workers, use the M & M RAIL CLAMP IT WILL NOT SLIP.

The M & M RAIL CLAMP is used in all basic industries, because it resists weight of heaviest cars. Order one and see how safe, how dependable it is.

SAFETY FIRST SUPPLY CO.
425 Magee Street · Pittsburgh 19, Pa.

1. A service platform or runway giving access to several bearings. Moving parts of machinery should not project over platforms; if this is unavoidable, these parts should be enclosed.

2. A small car suspended from an overhead I-beam enables the oiler to travel parallel to the line shaft and reach bearings with his oil can or grease gun.

3. Long-spout gravity flow or force-feed oil cans enable the oiler to stand in the clear. Some of these cans have spouts long enough to reach overhead line-shaft bearings from the floor.

4. Oil reservoirs at individual bearings with control devices operated by hand poles.

5. Extension pipes on bearings where grease or oil cups are in the danger zone. These may not be practical where low temperatures make it difficult to force oil or grease through the pipes. * * *

Mechanization to Bring More Machine Accidents

MACHINERY, the cause of one-third of the permanent partial disabilities suffered by today's workers, will become an even more important factor in accidents and injuries as mechanization and automation are stepped up, according to Theodore F. Hatch in a talk at the annual meeting of the American Society of Mechanical Engineers.

Mr. Hatch, professor of industrial health engineering in the University of Pittsburgh's Graduate School of Public Health, stressed the necessity of designing machinery with an eye toward minimizing the likelihood of human errors. Among factors contributing to such errors, he said, are poor lighting, excessive noise, vibration, monotony of operation and failure to adapt machine dimensions to human dimensions.

"Pushing the wrong switch button among a battery of identical buttons reflects an engineering rather than an operator failure.

A truck accident resulting from failure to apply brakes soon enough may be caused by restricted leg room for the driver, as well as by inattention to the job," he said.

Engineers, he said, must take the lead in translating informa-

Section 8—Machine Operation and Guarding

tion from the biosciences into useful tems for application to engineering.

He blamed two factors for the lack of adequate knowledge of human capacities and behavior: failure of engineers to achieve a deep understanding of the anatomical, physiological and psychological problems involved, and failure of bioscientists to recognize the need to work with industrial engineers on this problem.

The solution, he said, may lie in a field of activity born during World War II—human engineering.

"Human engineering is built on the basic sciences of anthropometry, physiology, psychology and related fields. Of particular significance to engineers in this development is the repeated demonstration of quantitative relationships between external stress and human response, many of which can be accounted for on a rational basis and can even be expressed in terms of biophysical equations."

Manual Handling

MANUAL HANDLING is still needed frequently even in highly mechanized industries. Human muscles, however, are reinforced by many types of nonpowered equipment which increase their capacity and lessen the chances of strain.

The simplicity and lower cost of these appliances sometimes lead to neglected maintenance. Each item should be kept in good condition and used correctly.

Maintenance records should show the condition of each piece of equipment.

Hand trucks, wheelbarrows and **dollies** are on the borderline between mechanical and manual equipment. They are durable and uncomplicated but they need regular servicing. Axles should be kept well lubricated.

Hooks are used for handling logs, lumber, crates, boxes and barrels where the object will not be damaged. Hooks should be inspected daily and kept sharp. If a hook is carried in the belt, the point should be covered. The worker should be trained to use the hook so that it will not glance off hard objects.

Bars. The point or edge of a crowbar should be kept sharp and position of hand and body should minimize the chance of pinching or falling if the bar should slip or the object move suddenly.

Car movers, not crowbars, should be used to move cars on steel rails. When two men are needed, two car movers should be used. The same mover should not be used by more than one man.

Rollers are used for moving heavy, bulky objects. A sledge or bar, not hands or feet, should be used to move rollers under loads.

NO SAFER PROTECTION FOR PUNCH PRESS FEEDING

OSBORN Safety Pliers can't shatter if accidently caught in closing press dies . . . can't send a blinding splinter into an operator's eyes . . . can't damage your press dies!

They're made of Osmolloy, the amazing lightweight Aluminum alloy that flattens under impact—instead of shattering. Suggestions for virtually any individual application are yours for the asking . . . ask for Bulletin No. 1056 for the standard designs. THE OSBORN MANUFACTURING CO., Argonne Road, Warsaw, Indiana.

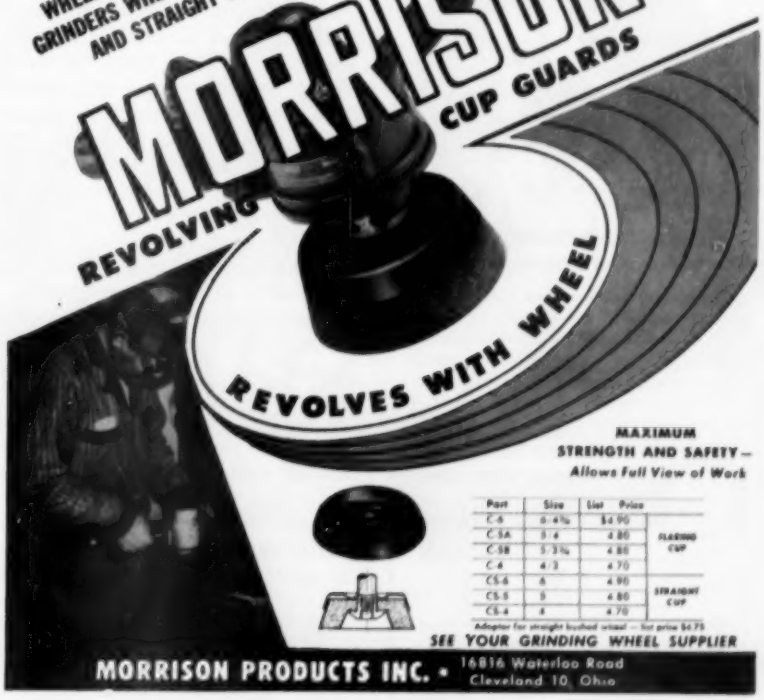
OSBORN SAFETY PLIERS

LATEST DEVELOPMENT IN WHEEL GUARDS . . . FOR PORTABLE GRINDERS WHEN USING FLARING CUP AND STRAIGHT CUP WHEELS . . .

MORRISON CUP GUARDS

REVOLVING

REVOLVES WITH WHEEL



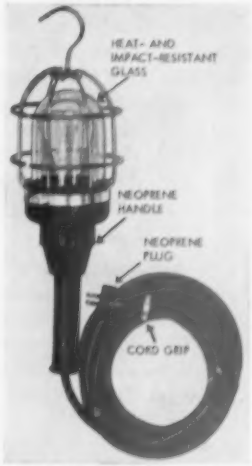
MAXIMUM STRENGTH AND SAFETY— Allows Full View of Work

Part	Size	List Price	
C-6	6-6¾	$4.90	FLARING CUP
C-5A	5-6	4.80	
C-5B	5-3¼	4.80	
C-6	4-3	4.70	
CS-6	6	4.90	STRAIGHT CUP
CS-5	5	4.80	
CS-4	4	4.70	

Adapter for straight bushed wheel — list price $4.75

SEE YOUR GRINDING WHEEL SUPPLIER

MORRISON PRODUCTS INC. • 16816 Waterloo Road Cleveland 10, Ohio



No. 70 C & E Vaporproof Portable Lamp Guard (Also non-vaporproof equipment)

For Dependability and Safety—C & E

Since 1910, C & E safety electrical equipment has served many industries well. All C & E portable lamp guard handles, attachment plugs, sockets and connector bodies are made of high grade, oil-resistant Neoprene compound. We specialize in heavy duty rubber cord sets and extension lights.

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Our Engineering Department will be glad to design special items. Ask on your letterhead for Catalog 58-N.

Electrical safety products

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Power Press Guards

Protect Operators • Increase Production

Wiesman cam-action press guards enable operators to work at top speed without fear of accident. Guarding is effective and completely automatic . . . does not hamper operator's vision or movement. For all sizes and styles of presses. Used by hundreds of firms. Inexpensive . . . easy to install.

Over 30,000 sold

Write for descriptive folder and 30-day FREE trial offer.

Name_____

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Use of Hand Trucks

The type of truck most suitable for the work should be used. No one type of truck is suitable for handling all types of loads.

On a two-wheeled truck, the load's center of gravity should be placed well forward so that the weight lies on the axle and not on the handles. Some two-wheeled trucks have brakes so the worker need not hold the truck with a foot on the wheel or axle.

Knuckle guards on two-wheeled trucks and wheelbarrows protect hands from jamming against obstructions.

Tongues of flat trucks may be provided with counterweights, springs, or hooks to hold them vertical when not in use. Otherwise, workers should be trained to leave handles in a position that will not create a tripping hazard.

To protect feet, wheels should be as far under the truck as possible. Wheel guards may be installed on some trucks.

Four-wheel trucks should be pushed, not pulled, particularly when the truck is going down an incline.

Handling Specific Objects

Drums and barrels can be handled more safely on an incline with ropes or other tackle to control their motion. The drum or barrel should be snubbed with a rope, one end of which is fastened securely to the platform from which the object is to be lowered. The rope should then be passed around the drum and the load lowered gradually.

Sheet metal should be handled with leather gloves, hand leathers, or gloves with metal inserts. Bundles of sheet metal should be handled with power equipment.

Sheet glass should be handled with gloves or hand leathers, and wrists and forearms should be covered with long leather sleeves. A leather or canvas apron and guards to protect feet and ankles should also be worn.

Large panes of glass should be handled by two or more men using canvas slings and padding to protect head, neck and shoulders. Where large panes are carried a considerable distance, an A-frame truck should be used. • • •

MAKE YOUR FANS SAFER!

Protect Workers From Injury

This fan guard prevents hand, arm and head injuries. Made of a mesh fabric, it is washable, mildewproof and won't interfere with the normal flow of air and is non-static.

Cover protects back and sides of fan as well as the front, is inexpensive and easy to install.

Immediate Delivery. Write to

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Safety Equipment Co.

83-85 Howell Street Rochester 7, N. Y.

***NEW!* For Circular Saws one tool that GUIDES while it GUARDS!**

SAFETY WITH VISIBILITY

A versatile *combination* visual circular saw guard *and* saw fixture, uniting the ultimate in precision-designed tools for efficient *guiding* with the maximum in 100% *safe guarding* has recently been introduced and marketed by the Brett-Guard Company. *Simple* to set up . . . *economical* for both large and small jobs . . . so *safe* that it's being used in vocational schools for the blind . . . made of transparent PLEXIGLASS that lets you *see* what you *saw* . . . *fully adjustable* for all those up-till-now impossible-to-guard cuts . . . fitting *all* circular table-type saws for 6" to 16" blades . . . here is truly the last *word* in both safety *and* efficiency!

Just a line to us brings the BRETT-GUARD to your plant for a

30-day FREE TRIAL

Specify Mfr's. Name and Blade Diameter of your table saws.

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ENGLEWOOD, NEW JERSEY

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16mm DEMONSTRATION FILM AVAILABLE

IN THIS SECTION

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• • •

INDUSTRIAL FIRE PROTECTION has been defined as the business of staying in business. Every day nearly a hundred plants suffer serious damage from fire. Of those destroyed, some 40 per cent go out of business.

Much of the loss is uninsurable. Employees lose jobs and the community feels the loss of the payroll.

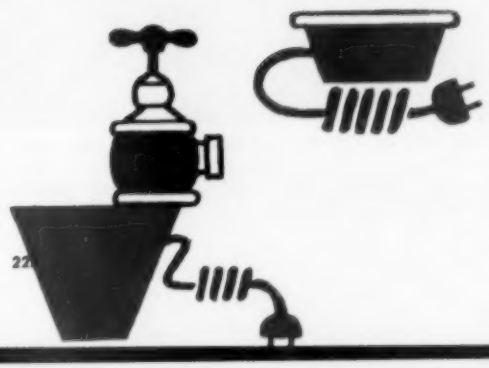
Fire safety is based on sound fire prevention engineering — fire-resistive construction, segregation of hazardous processes, limitation of hazardous areas, and protection of openings between floors.

Preparedness is the next line of defense. It means fire-fighting apparatus adequate for the risks involved, with trained men ready to use it if fire should break out.

Plant protection forces have saved life and property on many occasions when the forces of nature went on the rampage. In the event of enemy action in wartime, they would be a source of strength for civil defense.

PLANT PROTECTION

9



Fire-Fighting Methods

FOUR BASIC principles govern the control of fire and protection of life and property:

- **Fire prevention engineering**
- **Early detection and extinguishment**
- **Damage control — limiting damage due to fire and fire extinguishment**
- **Prevention of personal injuries from fire or panic**

Causes of Fire

The majority of fires in industry can be traced to four general causes:

1. Open flames, high temperatures—Stoves, furnaces, ovens, welding and cutting, lamps, dryers, heated pipes and surfaces, matches, smoking.

2. Friction—Hot bearings, belts, cutting, grinding.

3. Electricity—Defective wiring, arcs, sparks, heat resistance, static electricity.

4. Chemical reactions—Spontaneous ignition, use of reagents, acids, oxidizing agents.

Extinguishing Methods

Many types of apparatus are available for various risks but all extinguishing methods are based on one or more of three principles:

1. Eliminate oxygen from air.
—Replace air with inert gas.
—Exclude air with a noncombustible cover.
—Use a chemical which will dilute oxygen in air below point required to support combustion.

2. Remove fuel supply.
—Shut off flow in liquid or gas supply lines.
—Remove burning fuel.

3. Reduce temperature below ignition point.
—Cool burning material with water or chemicals.

Fire prevention engineering. The services of a qualified fire prevention engineer often will be helpful in planning prevention and protection.

First step is a survey of the plant—layout, manufacturing processes, materials handled, storage methods and fire-protection facilities.

With this information, plans can be made for improving structure and layout, installing additional equipment where needed and training employees in prevention and extinguishment.

Water Supply. Water is the most widely used and effective extinguishing medium for most fires. Important exceptions are those with electrical equipment, flammable liquids and in materials where water damage would be excessive.

In determining supply requirements, structural conditions and processes, and the number of streams that might be required to cope with a blaze must be considered.

Pumping equipment should supply enough streams at adequate pressure. Allowance should be made for pumps out of service for repairs and for continuity of pumping in event of power failure.

Hydrants should be located throughout the plant area so as to give adequate coverage of all buildings, and preferably not more than 50 ft. from any building.

Systematic maintenance is essential. When hydrants are installed, attention should be given to drainage to minimize the danger of freezing in cold weather. Hydrants should be kept clear of snow and a thawing device provided.

Standpipe and hose provide effective protection inside buildings when used by men trained in handling heavy streams. They are a valuable auxiliary to the city fire department. Piping should be of sufficient size for buildings of more than four stories.

Couplings. All outside hydrant nipples and hose couplings should have American Standard 2½-in. fire hose thread.

The 2½-in. single jacketed rubber-lined hose is ordinarily used outside. It is flexible and lightweight. Double-jacket hose is used principally for rougher service in municipal fire departments.

Rubber-covered hose is sometimes needed where there is exposure to fumes or corrosive liquids. Neoprene has been found superior to natural rubber for most uses.

The 1½-in. hose is useful for small fires and for wetting down fires after the blaze is under control. It can be handled by one or two men.

MOBILE fire-fighting and emergency unit developed by employees at Reading Company's locomotive shops. On the wagon are extinguishers for all types of fires, gas masks, first-aid kit, ladder, wire cutters, rope, fire blanket and other emergency items. Blanket is released from container by pulling a cord.

Playpipes and nozzles. Standard underwriters' playpipes throw an effective stream but are difficult to handle, particularly on ladders. The short, rigid playpipes with strap and ladder hook, with shut-off nozzles to reduce water damage, are more suitable for plant use.

Adjustable spray and straight stream nozzles (for both 2½- and 1½-in. hose) give water-curtain protection for firemen and a blanketing effect. They also provide solid streams for penetration.

Water spray (fog) nozzles are effective for oil fires. Water fog, owing to its low conductivity, can be used safely on electrical fires. Its effective range is only a few feet but this can be offset to some extent by using applicator pipes of varying lengths.

Foam-generating equipment is used where large quantities of flammable liquids are stored. For some exposures permanent generating equipment should be installed.

Foam systems may be either automatic or manually operated. There are two types of foam, chemical and mechanical.

Chemical foam is formed by a chemical reaction in which masses of bubbles of carbon dioxide gas and a foaming agent produce an expanded froth.

Mechanical foam consists of bubbles of air produced when air and water are agitated mechanically with a foam solution. * * *

Types of Fires

Fires have been classified by underwriters and manufacturers in three main groups.

Class A. Fires in ordinary combustible materials, such as wood, paper, textiles and rubbish. They require quenching or cooling effects of water or solutions containing large proportions of water.

Class B. Fires in flammable liquids, such as gasoline, solvents, oil, grease, paint, varnish and lacquers, where blanketing or smothering effect is essential.

Class C. Fires in electric equipment, such as motors, generators, and switch panels. These require a nonconductive extinguishing agent.

Fires in motor vehicles, aircraft and motorboats have the same problems of extinguishment as Class B but equipment must be portable. Extinguishing agents must be nonfreezing.

Limiting Fire Areas

For large buildings, fire-resistive partitions with fire doors are important in confining fire to a limited area. Types of doors for various exposures have been approved by testing laboratories.

Fire doors should either close automatically each time they are opened or be closed by a heat-actuated device if fire should break out. The most common device is the fusible link.

The releasing device should be located where it will be affected quickly by heat passing through the doorway and should be protected against mechanical injury.

Where flash fires may occur, quick operating devices are preferable, except for doors used as exits.

Fire shutters are used for windows where there is an exposure hazard from adjacent buildings. Shutters may be swing type (tin clad or steel) or rolling steel. The latter can be installed where space is too limited for swinging shutters.

Sliding shutters are not recommended where snow and ice might interfere with their operation.

Keeping bearings properly lubricated will prevent overheating, a cause of many fires in oil or lint deposits at the bearings.

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—Standpipe and Hose Systems; Pamphlet 14.
—Water Spray Systems for Fire Protection; Pamphlet 15.
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—Organizing, Drilling and Equipment of Private Fire Brigades; Pamphlet 27.
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Underwriters' Laboratories: Fire Protection Equipment List.

First-Aid Extinguishers

First line of defense against fire

PORTABLE extinguishers can be brought into action in the vital minutes before the company or city fire department can reach a blaze — sometimes before sprinklers can operate. Their prompt use by trained employees has prevented heavy losses from both fire and water.

The limitations of portable apparatus should be recognized. They are not a substitute for heavy-duty or automatic equipment.

Types of portable extinguishers as classified by Factory Mutual Laboratories are:

1. Anti-freeze
2. Carbon dioxide
3. Dry chemical
4. Foam
5. Pump tank
6. Soda and acid
7. Vaporizing liquid
8. Water-filled (gas cartridge or air pressure)
9. Water pails

Some extinguishers are available in both hand and wheel types. The latter is moved easily and has extra extinguishing capacity.

For Class A Fires Only

These extinguishers should be used only on Class A fires in ordinary combustible materials — never on flammable liquid, grease or electrical fires.

Anti-freeze solution extinguishers are of two basic types. One uses a cartridge which releases expellant gas when punctured. The other uses a shut-off valve which retains the gas in the same single chamber with the extinguishing solution.

Extinguishing agents are either calcium chloride or alkali-metal salt solutions (loaded stream). The latter are more effective than soda-acid extinguishers of equal size.

Only recharges furnished by the manufacturer and specified on the extinguisher nameplate should be used.

Solutions will give protection at temperatures as low as —40 F.

Water-filled extinguishers are similar to the anti-freeze type but use plain water as the extinguishing agent. Either gas cartridge or stored air pressure may be used as the expellant.

Pump tanks are covered containers, usually cylindrical, with a double-action pump, discharging through a short length of hose and a nozzle. The tank is filled through a removable cap at the top.

For low temperatures, anti-freeze solutions are used.

Water pails. The most useful type is the 12-qt. size with flat bottom, made of 24-gauge galvanized iron. A loose-fitting cover keeps out dirt and retards evaporation. Pails should be painted bright red with FIRE in large letters.

If calcium chloride anti-freeze solution is used, pails should be coated inside, first with red lead then with asphalt-base paint. Calcium chloride of "fire protection grade" should be used.

Soda-acid extinguishers have an outer container holding a charge of sodium bicarbonate dissolved in water and an inner container of acid. They are operated by inverting, which allows acid and bicarbonate solution to mix. Carbon dioxide gas is generated with sufficient pressure to propel the contents.

Common size is 2½ gals. It provides a stream 30-40 ft. which lasts about 1 minute.

For Class A and Class B Fires

These extinguishers are suitable for Class A fires in ordinary combustibles and Class B fires in flammable liquids where a blanketing effect is needed. Never use on electrical fires.

TYPES OF EXTINGUISHERS
Left to right:
Hand pump
Foam
Vaporizing liquid
Dry chemical
Carbon dioxide

Soda-acid, gas-cartridge, loaded stream and foam extinguishers are similar in appearance. All are plainly marked and carry directions for use.

BE SAFE FROM FIRE... with Kidde extinguishing equipment

HAND PORTABLES

Trigger Carbon Dioxide | Squeeze-Valve Carbon Dioxide | Foam Soda-Acid Clear Water Anti-Freeze | Pressurized Water Anti-Freeze | Pressurized Dry Chemical | Cartridge-Operated Dry Chemical | Pump Tank Water Anti-Freeze | VI Pressurized | VI Pump

Kidde hand portables are designed to knock fires out *fast*, come in a variety of types and models. Kidde offers a complete line, a type and size for every need. The Kidde line includes carbon dioxide extinguishers with fast-acting trigger release or squeeze-valve release in capacities of 2½ to 20 pounds. Kidde dry chemical extinguishers can be had in pressurized models of 5 and 10 pounds capacity, and in cartridge-operated models of 20 and 30 pounds. New Kidde wet chemical extinguishers (foam, soda-acid) are available in 2½ gallon bronze or stainless steel models, including cartridge-operated and pressurized water or water-anti-freeze units. Kidde vaporizing liquid extinguishers come in pump capacities of 1 and 1½ quarts, pressurized in 1 and 1½ quarts and 1 gallon. Kidde pump tank extinguishers, in steel or copper shells, are available in 2½ and 5-gallon sizes.

• • • • • •

CUSTOM-ENGINEERED CARBON DIOXIDE SYSTEMS

New Kidde pressure-operated carbon dioxide extinguishing systems are individually designed to fully protect even the most dangerous hazards, use no falling weights or clumsy mechanical triggering methods. Pneumatic Control Heads insure instant and complete carbon dioxide discharge. Directional valves afford protection to more than one hazard using the same bank of carbon dioxide cylinders. All operating parts are self-enclosed for safety. Visual indicators show at a glance if system is "set" or "released."

SMOKE DETECTORS AND KIDDE-ATMO FIRE DETECTING SYSTEMS

Before flames are visible – before heat gives warning, the Kidde smoke detector will sound an alarm at a central station and tell exactly where fire lurks. Even deep-seated smoldering fires are quickly and easily spotted.

Kidde-Atmo is a wide-area fire detecting and warning system which, through the principle of rate-of-temperature-rise, sounds an alarm at the first hot breath of fire.

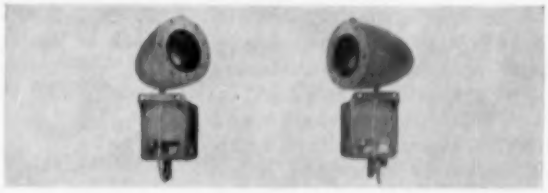
Both detecting systems can also close doors, shut off motors or blowers – all automatically.

BE SAFE FROM THIEVES... with Kidde burglar alarms!

ULTRASONIC BURGLAR ALARMS

By saturating the protected area with high-frequency sound waves, Kidde's Ultrasonic Burglar Alarm System gives *complete* wall-to-wall, floor-to-ceiling protection. Properly installed, the portable, tamper-proof Kidde system qualifies for an Underwriters' Laboratories number 2 certification. Write today for Kidde's Ultrasonic Alarm Booklet, on the *best* burglar protection at the *lowest* cost!

PHOTO-ELECTRIC BURGLAR ALARMS



By using a beam of invisible 'black light,' Kidde's tamper-proof Photo-Electric Alarm provides complete burglar protection up to a range of 900', indoors or out. If beam is broken, alarm sounds locally or at central plant station. Rugged, transistorized circuit draws only 6½ watts. Optional batteries keep system in operation if main power fails. Write Kidde for more information.

Kidde (K Kidde)

Walter Kidde & Company, Inc., 345 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal—Toronto

PLANT GUARD checks extinguishers and reports on their condition.

Foam. The chemical foam extinguisher is shaped like a soda-acid extinguisher and operated the same way. In place of plain water it contains a foam-making ingredient.

When the extinguisher is inverted, the chemicals mix and force out a foaming stream. The hand model contains 2½ gals. of liquid and generates 8 times that amount of foam.

In purchasing charges, brand and name of manufacturer should be specified.

For Class B and C

Only these extinguishers may be used safely on Class C fires (electrical equipment) as well as on Class B fires (flammable liquid). They do not contain water and need no winter protection.

Carbon dioxide. Portable carbon dioxide extinguishers consist of a storage cylinder, a hand-operated valve, and a discharge horn connected to the valve by flexible hose or a short piece of metal tubing.

These extinguishers are discharged by operating the valve by means of a handwheel, squeeze grip or trigger.

The gas is noncorrosive and leaves no residue. It has no lasting blanketing effect and is not considered effective for Class A fires. These extinguishers have a comparatively short range.

Extinguishers are available in many sizes in both hand and wheel-mounted models containing from 2½ to 750 lbs. of carbon dioxide.

Dry chemical. This type of extinguisher consists of a container

CLASSIFICATION OF FIRE EXTINGUISHERS

	Classifications Under Old Method	Approximate Classifications Under Present Method
Chemical Solution—Soda Acid		
1¼, 1½ gal.	A-2	1-A
2½ gal.	A-1	2-A
17 gal.	A	10-A
33 gal.	A	20-A
Water		
1½, 1¾ gal. (pump or pressure)	A-2	1-A
2½-gal. (pump or pressure)	A-1	2-A
4 gal. (pump or pressure)	A-1	3-A
5 gal. (pump or pressure)	A-1	4-A
17-gal. (pressure)	A	10-A
33-gal. (pressure)	A	20-A
6 10-qt. pails and 25 gal. cask (minimum)	A-1	2-A
Loaded Stream		
1-gal.	A-2, B-4	1-A
1¾ gal.	A-1, B-2	2-A, ½-B
2½-gal.	A-1, B-2	2-A, ½-B
33-gal.	A	20-A
Foam		
1¼-gal.	A-2, B-2	1-A, 2-B
1½-gal.	A-2, B-2	1-A, 2-B
2½-gal.	A-1, B-1	2-A, 4-B
5 gal.	A-1, B-1	4-A, 6-B
10-gal.	A, B	6-A, 8-B
17-gal.	A, B	10-A, 10-B
33-gal.	A, B	20-A, 20-B
Vaporizing Liquid (carbon tetrachloride base)		
1, 1¼, 1½-qt. (pump)	B-2, C-2	½-B, C
1, 1½, 2, 2½-qt. (pressure)	B-2, C-2	½-B, C
1-gal. (pressure)	B-2, C-1	1-B, C
3½-gal. (pressure)	B-2, C-1	1-B, C
Vaporizing Liquid (chlorobromomethane)		
1 and 1½-qt. (pressure)	B-2, C-1	1-B, C
1 gal. (pressure)	B-2, C-1	2-B, C
Carbon Dioxide		
6 or less lbs. carbon dioxide	B-2, C-2	1-B, C
7½ lbs.	B-2, C-1	2-B, C
10 lbs.	B-2, C-1	4-B, C
12 lbs.	B-2, C-1	4-B, C
15 and 18 lbs.	B-1, C-1	4-B, C
20 lbs.	B-1, C-1	4-B, C
25 and 26 lbs.	B-1, C-1	6-B, C
50 lbs.	B-1, C-1	10-B, C
75 lbs.	B-1, C-1	12-B, C
100 lbs.	B, C	12-B, C
Note: Carbon dioxide extinguishers with metallic horns will not carry any C classification.		
Dry Chemical		
6¼ or less lbs. dry chemical	B-2, C-2	4-B, C
7½ lbs.	B-2, C-1	6-B, C
10 lbs.	B-1, C-1	8-B, C
12 lbs.	B-1, C-1	8-B, C
15 lbs.	B-1, C-1	8-B, C
20 lbs.	B-1, C-1	16-B, C
30 lbs.	B-1, C-1	20-B, C
75 lbs.	B, C	40-B, C
150 lbs.	B, C	40-B, C
300 and 350 lbs.	B, C	40-B, C
Wetting Agent		
10 gals.	A, B	6-A
20 gals.	A, B	12-A
50 gals.	A, B	30-A

ABOVE is the method of classifying extinguishers in NFPA No. 10, with classifications used in earlier editions. Table indicates approximate conversion from old to new method of classification. Since accurate classification of extinguishers already in service and labeled under the old method can be determined only by actual fire tests, only approximate conversion classification can be given.

A piece of wire that might cause you disaster!

Defective or overloaded wiring is one major cause of industrial fires. Like all fires, they start small but grow rapidly – unless immediately stopped.

There are specific Pyrene-C-O-Two *safety-engineered* extinguishers for every class of fire: (A) combustible solids, (B) flammable liquids and the hazardous (C) electrical. Call your local Pyrene-C-O-Two distributor today! He carries a complete line of quality extinguishers, systems, brass goods, hose and accessories. Or write to:

Underwriters' Laboratories and Factory Mutual Approved

Pyrene C-O-TWO

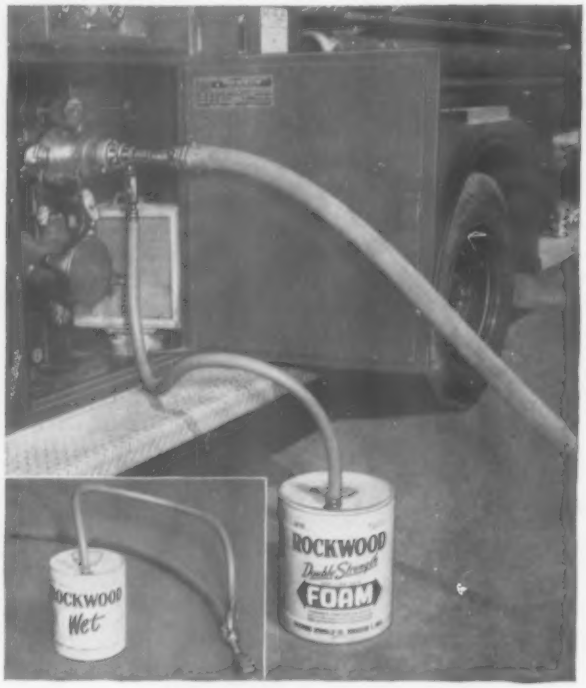
PYRENE-C-O-TWO DIVISION

THE FYR-FYTER COMPANY

Dept. NSN, Newark 1, New Jersey

BRANCHES IN ATLANTA • CHICAGO • DALLAS • DETROIT • SAN FRANCISCO

ROCKWOOD built-in proportioning systems for industrial fire trucks



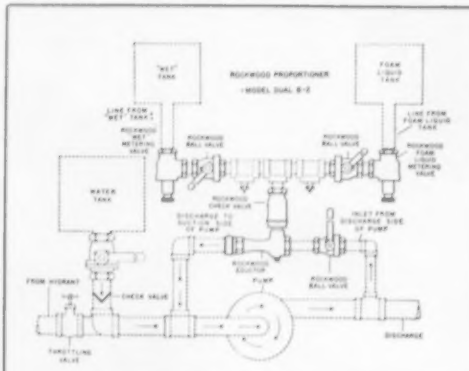
Rockwood's long, practical experience and constant research assures you the safest, most economical means of fighting all types of fires. These pages illustrate a few of Rockwood's family of products that are playing a vital part in fire fighting programs throughout America.

Rockwood's new Double Strength FOAM and Rockwood WET offer you many advantages

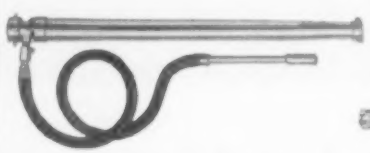
Double Strength FOAM has double foam-making capacity, cutting in half the transportation cost and storage space. It is faster spreading and flows freely — even at subzero temperatures. An outstanding FOAM liquid to go with Rockwood's advanced type of FogFOAM and FOAM Nozzle for quickly putting out fires in gasoline and other similar flammable liquids. Available in 5 gallon cans or 50 gallon drums.

Rockwood WET increases the spread and penetration of water into deep seated fires involving ordinary combustibles such as wood, paper, cloth, etc. It greatly reduces the water needed to extinguish such fires. Available in 50 gallon drums, 5 gallon and 1 gallon cans.

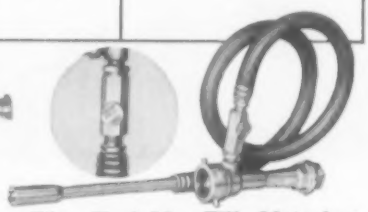
Regular FOAM and All Purpose FOAM are also available.



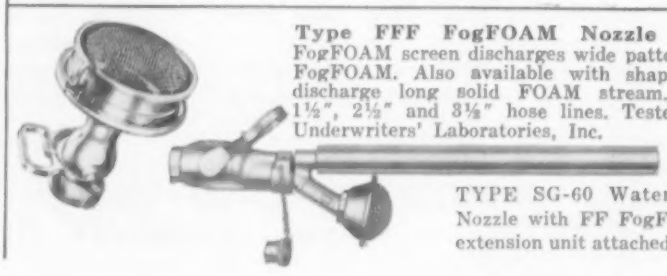
Proportioning System. Model B-2, around-the-pump proportioner. Used when pressure is maintained by pump. Custom-engineered systems are also available.



The F-501 Nozzle developed for use with 1½" hose to provide an economical means of applying a solid stream of FOAM on flammable liquid fires.



The Variable FW Metering-Check Valve with FW Eductor incorporates both the Metering Valve and Ball Check Valve in one unit and meters liquid into the hose line in any proportion from 1% through 6%.



Type FFF FogFOAM Nozzle with FogFOAM screen discharges wide pattern of FogFOAM. Also available with shaper to discharge long solid FOAM stream. For 1½", 2½" and 3½" hose lines. Tested by Underwriters' Laboratories, Inc.

TYPE SG-60 WaterFOG Nozzle with FF FogFOAM extension unit attached

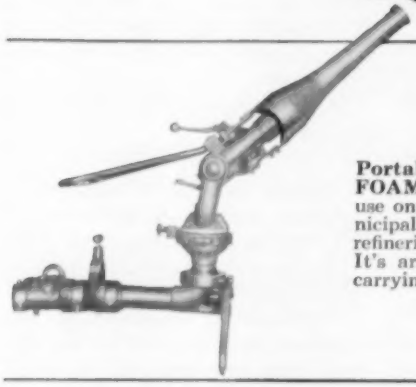
Rockwood offers you 4 types of turret control

...and any Rockwood turret gives you 4 types of discharge (1) FogFOAM, (2) Solid FOAM stream, (3) WaterFOG,(4) Solid water stream

Remote Hydraulic Control Single Type FFF FogFOAM Turret Nozzle on Type 0-10 U. S. Air Force crash rescue fire fighting truck. Similar turrets can be supplied for oil refineries, chemical and industrial plants and municipalities. Hydraulically operated dual turrets also available.

Remote Manual Control Type FFF FogFOAM Turret Nozzle provides efficient operation of turret from driver's seat within truck cab — for small municipalities, airports or industrial properties where limited personnel is available.

Direct Manual Control Dual Type FFF FogFOAM Turret Nozzles — can be operated directly by firemen from cab roof.

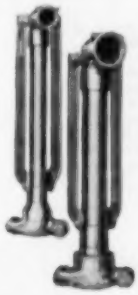


Portable Type FFF FogFOAM Turret Nozzle for use on fire hose lines by municipal fire departments, oil refineries and industrial plants. It's arranged for convenient carrying on fire trucks.

ROCKWOOD

WaterFOG Equipment

Type SG-48 WaterFOG Nozzle. Easy to handle. Discharges high or low velocity WaterFOG or straight water stream.



Lightweight Rotating Cellar and Attic Pipe. Fights fires in cellars, attics, under piers, bridges, etc.

Type N22 WaterFOG Nozzle. Discharges high velocity WaterFOG. For general use around live electrical equipment.

Type N23 WaterFOG Nozzle with Swivel Handles. Discharges high velocity WaterFOG with higher discharge and greater range than Type N22 Nozzle.

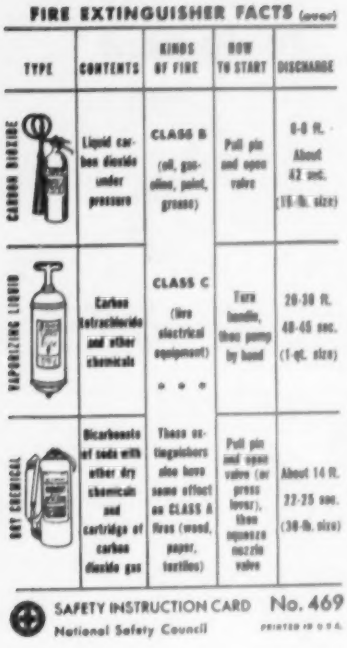
ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

PORTABLE FIRE PROTECTION DIVISION

1570 Harlow Street, Worcester 5, Massachusetts

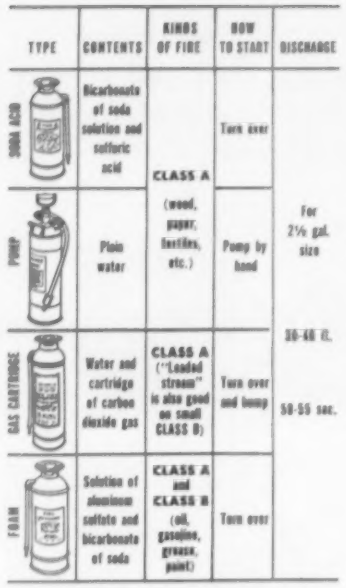
Distributors in all principal cities



FIRE EXTINGUISHER FACTS (cont'd)

TYPE	CONTENTS	KINDS OF FIRE	HOW TO START	DISCHARGE
CARBON DIOXIDE	Liquid carbon dioxide under pressure	CLASS B (oil, gasoline, paint, grease)	Pull pin and open valve	0-8 ft. · About 42 sec. (15-lb. size)
VAPORIZING LIQUID	Carbon tetrachloride and other chemicals	CLASS C (live electrical equipment) * * *	Turn handle, thus pump by hand	20-30 ft. 40-45 sec. (1-qt. size)
DRY CHEMICAL	Bicarbonate of soda with other dry chemicals and cartridge of carbon dioxide gas	These extinguishers also have some effect on CLASS A fires (wood, paper, textiles)	Pull pin and open valve (or press lever), then squeeze nozzle valve	About 14 ft. 22-25 sec. (30-lb. size)

SAFETY INSTRUCTION CARD No. 469
National Safety Council



TYPE	CONTENTS	KINDS OF FIRE	HOW TO START	DISCHARGE
SODA ACID	Bicarbonate of soda solution and sulfuric acid	CLASS A (wood, paper, textiles, etc.)	Turn over	For 2½ gal. size
PUMP	Plain water		Pump by hand	
GAS CARTRIDGE	Water and cartridge of carbon dioxide gas	CLASS A ("Loaded stream" is also good on small CLASS B)	Turn over and bump	30-40 ft. 50-55 sec.
FOAM	Solution of aluminum sulfate and bicarbonate of soda	CLASS A and CLASS B (oil, gasoline, grease, paint)	Turn over	

DO NOT USE *Those Water Base Extinguishers* ON ELECTRICAL FIRES (*see other side*)

of dry chemical which is ejected by carbon dioxide, nitrogen or dry air stored in cartridges or cylinders. It is operated by a quick-opening valve with on-off control of the discharge.

Dry chemical extinguishers may be used safely on fires in flammable liquids and electrical equipment. They should not be used on telephone switchboards or delicate contactors or relays. Because of the insulating qualities of the chemical, extreme care would be needed in removing the residue.

For Class A fires these extinguishers are less effective than those which provide a wetting action.

Only the recharge recommended by the manufacturer should be used.

Vaporizing liquid. The extinguishing agent is specially treated carbon tetrachloride or chlorobromomethane. The charge is expelled by a hand pump or by air, nitrogen or carbon dioxide pressure.

Most familiar model is the 1-qt. size frequently carried on motor vehicles and motor boats. Smaller sizes do not provide adequate protection.

Larger units of ½- to 3-gal. capacity are operated by stored gas or air pressure.

These extinguishers should be charged only with the liquid specified by the manufacturer and taken from previously unopened containers.

Protection from Freezing. Carbon-dioxide, vaporizing-liquid and dry-chemical extinguishers won't freeze.

Foam and soda-acid extinguishers should be installed in heated cabinets.

Water-filled extinguishers, pump tanks and fire pails use calcium chloride solutions.

Recharging. Commercial carbon tetrachloride should not be used for vaporizing-liquid extinguishers. It may cause deterioration of the shell and interior mechanism. Liquid furnished by manufacturers is treated to remove impurities and to depress the freezing point.

Before recharging foam and soda-acid extinguishers, the shells and all parts should be thoroughly rinsed with warm water. * * *

Placing Extinguishers

An extinguisher may be useless if an employee must spend valuable minutes looking for it, or if it is blocked by piles of materials.

Here are 6 recommended rules:

1. Locate extinguishers close to likely fire hazards but not so close that they will be in the fire zone should fire occur.
2. Place extinguishers so access will not be blocked by fire.
3. Install enough extinguishers to deal with any expected blaze, considering the rapidity with which it might spread, intensity of heat, etc.
4. Mark locations conspicuously.
5. Identify each unit for the type fire it is designed to combat.
6. Protect extinguishers from traffic.

Marking locations. Contrasting backgrounds make extinguishers conspicuous and less likely to be overlooked in the excitement of a fire. Methods include:

1. Painting a large red or white background on the wall.
2. Painting a large red spot on the floor under the extinguisher.
3. Painting vertical red bands with yellow borders down a wall or column where equipment is placed.
4. Providing lights of distinctive color which do not conflict with exit lamps.

How Many Extinguishers?

The number of first-aid fire extinguishers to be installed should be determined by the jurisdiction having authority in accordance with the severity of the incipient fire anticipated, which includes:

1. Rapidity with which a fire may spread.
2. Intensity of heat that may be developed.
3. Accessibility of fire.

Special hazards, in addition to ordinary hazards of the occupancy, require installation of additional and /or substitute units of prescribed type.

Methods of determining the number and type of extinguishing units required will be found in NFPA No. 10. Classification of fire extinguishers under both old and new methods will be found in the accompanying table.

Requirements as outlined in NFPA No. 10 are based on the provision of Class A extinguishers. Supplemental Class B or Class C units are to be provided

is the first and only fire-resistant hydraulic fluid listed by

LISTED UNDER REEXAMINATION SERVICE UL® OF UNDERWRITERS' LABORATORIES, INC.

As you know, the UL listing required intensive tests to establish Pydraul's fire-resistance.

Those published findings are confirmed in Pydraul's 7 years of operating experience . . . never *once* has Pydraul been the cause of (nor contributed to) a fire loss. Compare this with the record of ordinary oil!

Take a look around any plant—if hydraulic operations are near possible ignition sources, you have a source of danger—fire danger!

To help you determine the fire risk in your plant, we'll be glad to send you a supply of *Hydraulic Fluid Survey* sheets—a simple, easy-to-use form for making an objective measurement of your fire risks.

Whether you are managing hydraulic operations or consulting and advising on how to make them SAFE . . . the *Hydraulic Fluid Survey* sheet provides a helpful guide to realizing just how many fire risks actually exist in your plant.

Pydraul: Reg. U. S. Pat. Off.

Send for your Hydraulic Survey Sheet today. There's no cost.
Organic Chemicals Division
MONSANTO CHEMICAL COMPANY
Functional Fluids Dept. I-71. St. Louis 1, Mo

MONSANTO®
WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

where blanketing or nonconducting extinguishing agents are necessary.

Following is a summary of recommendations for occupancies of varying severity:

Class I—Light hazard. Relatively small amount of combustibles, with incipient fires of minimum severity anticipated.

Examples: Office buildings, schools (exclusive of trade schools and shops) and public buildings. Limited areas within such buildings containing ordinary hazard occupancies are to be protected as required under Class II.

Class A extinguishers shall be provided throughout, so located that a person will not have to travel more than 100 ft. to reach the nearest device. At least 1 unit of extinguishing capacity shall be required for every 2500 sq. ft. of floor area.

Class II—Ordinary hazard. Incipient fires of average severity may be anticipated.

Examples: Department stores, warehouses and manufacturing buildings of average hazard.

Class A extinguishers shall be provided throughout, so located that a person will not have to travel more than 50 ft. to the nearest device. At least 1 unit of extinguishing capacity shall be required for every 1250 sq. ft. of floor area.

Class III—Extra hazard. Because of character or quantity of combustible extra severe incipient fires may be anticipated.

Examples: Woodworking, spray painting and dipping.

Class A extinguishers shall be provided throughout as specified for ordinary occupancies, with additional Class B and/or Class C extinguishers to be provided at the discretion of the authority having jurisdiction.

Special provisions of NFPA No. 10 relate to occupancies requiring Class B and Class C extinguishers.

Construction That Resists Fire

Fire-resistant construction is essential for any industrial or commercial building. Some types of construction can survive a fire with only minor structural damage.

Building materials should be noncombustible wherever practicable, although any material may be damaged by extreme heat.

Walls and openings should be planned to prevent rapid spread of fire. Large areas should be subdivided by fire walls, with openings protected by fire doors. This will help to limit damage of a segregated fire.

For nonhazardous occupancies heavy plank roofs and floors are permissible. Heavy timbers are slow burning.

Wooden walls, joisted quick-burning floors and roofs, and inaccessible combustible spaces should be avoided.

Hazardous processes should be cut off by fire walls or fire-resistant partitions. Severe hazards should be housed in separate buildings.

Explosion hazards require explosion-venting windows or other means of relieving pressures to minimize structural damage.

Important buildings with combustible roofs and floors should be separated by as much yard space as possible.

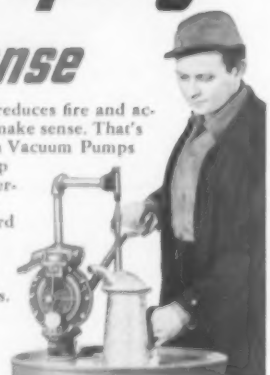
For buildings of more than one story, stairways, elevator wells, conveyors and chutes should be enclosed with fire-resistive walls. Fire doors installed at openings check spread of fire to other floors.

Blank walls, fire shutters or wired-glass windows offer protection against exposure fires. Open sprinklers are an additional safeguard.

Pumping makes sense

Any plant improvement that reduces fire and accident hazards certainly does make sense. That's the case when Tokheim High Vacuum Pumps are put into service. They help prevent spilling, slopping, overfilling and dripping. Operate on both forward and backward strokes—deliver 20 gallons per 100 strokes. Available with hose or spout outlets and other optional attachments.

Call your dealer or Tokheim representative; write for literature and approved list of liquids.



QUALITY TOKHEIM HIGH VACUUM HAND PUMPS

pump many liquids

Acetates • Alcohols • Aromatic Solvents
Chlorinated Solvents • Glycols • Ketones and Ethers • Petroleum Products & Solvents • Plasticizers • Water and Others.

Alternate parts for special liquids

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General Products Division
TOKHEIM CORPORATION
DESIGNERS AND BUILDERS OF SUPERIOR EQUIPMENT
1670 Wabash Avenue SINCE 1901 Fort Wayne 1, Indiana

Subsidiaries: Tokheim N.V., Leiden, Holland—GenPro, Inc., Shelbyville, Ind.
Factory Branch: 475 Ninth Street, San Francisco 3, California
In Canada: Tokheim-Reeder of Canada, Ltd., 205 Yonge St., Toronto, Ont.

EXTINGUISHERS RECLASSIFIED

An important development in fire protection during 1956 was the revision of *NFPA Standard on First-Aid Fire Appliances (NFPA No. 10)*. It presents a new scheme of classifying fire extinguishers designed to:

1. Eliminate inequities of the old classification system.

2. Encourage better design of extinguishers.

3. Promote development of new agents having increased extinguishing potential.

4. Develop a way to classify wheeled extinguishers so their potential could be properly determined.

5. Include recommendations for installation of extinguishers for protection of specific hazards.

NFPA No. 10 is published in separate pamphlet form (50 cents a copy) and in National Fire Codes, Vol. IV, 1956.

The Ansul dry chemical fire equipment pictured above includes portable hand units, wheeled and stationary units and a jeep installation. Ansul also manufactures automatic dry chemical piped systems, custom engineered for the hazard. Ansul equipment is listed and approved by Underwriters' and Factory Mutual Laboratories.

Only Ansul offers a Five Year Equipment Warranty

Your assurance of fast, dependable fire protection

For you, the buyer of fire equipment, Ansul's important 5 year warranty means many extra years of fast, dependable protection. It also means freedom from costly maintenance checks and repairs.

Special design and construction features make this warranty possible. Ansul's *weather-tight* construction keeps out moisture, resists corrosion. *Patented nozzles* deliver the right kind of stream for your hazard. A *sealed pressure cartridge* puts Ansul's "Plus Fifty" dry chemical to work immediately—no delay or lag. Finally, *rugged construction* makes it possible for Ansul equipment to give peak performance under the toughest operating conditions.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-93, Marinette, Wisconsin. *Write Ansul for your copy of new Fire Equipment Catalog.*

ANSUL

Automatic Protection

Detection and Alarm Systems, Automatic Sprinklers

COMPLETE fire protection uses both the human element and automatic devices. It employs watchmen and trains employees in fire-fighting methods. It also includes automatic devices for detecting and extinguishing fires and sounding alarms, and supervisory systems for watchmen.

An alarm system is part of the fire protection program. It may range from a coded blast on the factory whistle to an elaborate automatic system.

Sirens or special whistles are often used to avoid confusion with the regular whistles.

Where the municipal fire department is available, an alarm box may be located near the entrance or in one of the buildings. Auxiliary boxes may be placed at various points in the plant.

A direct connection to the nearest fire station offers added protection. Such a system may be operated manually or by a water-alarm device.

Supervisory Systems

Systems of various types detect fires and transmit alarms to a central station, also supervise watchmen's service and sprinkler systems.

These operate on three main plans:

1. **Central station system.** Signals are transmitted to an independent central station where they are recorded and proper action for the emergency taken. The central station may serve several companies.

2. **Proprietary system.** Similar to a central station but controlled and operated by the owner of the protected property.

3. **Local system.** Owned and operated by the protected company but does not have an operator constantly on duty at a central station.

Detectors and Alarms

Automatic fire-detection and alarm devices are operated most frequently by heat or smoke.

Heat-actuated systems operate on the principle that air expands when heated. Tubing contains air at atmospheric pressure. Heat of fire expands air, forcing it to travel at opposite directions to diaphragms which close and sound alarm. Detector tubing does not carry electric current and can be used anywhere.

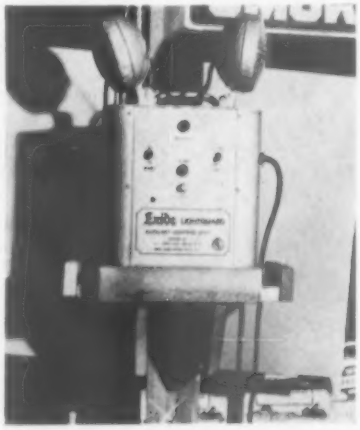
Detectors operate on the temperature-rate-of-rise principle, preventing false alarms from normal temperature changes or sudden short surges of heat.

Smoke detectors have the advantage of detecting deep-seated smoldering fires and giving a signal before flames are visible.

Continuous samples of air are drawn from protected spaces and passed through an analyzer tube. In the analyzer tube, smoke passes through a beam of light. The smoke reflects light on to photoelectric cells, increasing the cell output and sounding an alarm.

Watchmen's supervisory systems transmit and record signals made at watchmen's key stations. This system is frequently combined with fire-alarm systems. A plant guard's failure to check in at any station along his route is promptly recorded at the control desk or panel.

Such supervision has checked many incipient fires, prevented robberies and brought aid to watchmen rendered helpless by accident or illness. It has also prevented sprinkler-caused water damage.



AUXILIARY lighting unit, battery-operated supplies light in emergency. (Electric Storage Battery Co.)

Automatic Sprinklers

BECAUSE they have proved so effective in controlling fire losses, installations of fixed systems—particularly automatic sprinklers—generally are rated as the most important means of defense against fire.

For reliable protection, sprinklers are needed wherever a building or its contents provide an appreciable amount of combustible material. Even fireproof buildings need sprinklers to protect burnable contents and prevent damage to the structures.

Sprinklers should be located not only to protect the ceiling but also under wide benches or tables, in closets, dryers and other locations shielded from the discharge of ceiling sprinklers.

This extra coverage is important because heat from a fire in an unprotected area would open more sprinklers, causing drain on the water supply and excessive water damage.

Essential parts of a sprinkler are a nozzle, a releasing device and a deflector. The releasing device in most sprinklers is a soldered link element.

Another type features a quartz bulb containing a liquid that expands when heated and bursts the bulb.

A third type uses a low-fusing chemical that liquefies at the rated temperature and allows a strut to collapse.

Various types of heads are available for use under a wide range of temperature conditions. Heads of too high a rating are slow to operate. A fire would gain considerable headway and open more heads than needed. Soldered links with too low a rating may become weakened and operate prematurely.

more fire-killing power and a *new look!*

Fyr-Fyter's new pressurized 5-pound dry chemical extinguisher

More fire-killing power and a brilliant new look are now added to the many outstanding features of this rugged, lightweight pressurized 5-pound dry chemical extinguisher.

Underwriters' Laboratories awards it a *new high rating*, B-B, C. UL rating means average operator can extinguish 8 sq. ft. of deep-layer flammable liquid fire; also safe and effective on electrical fires!

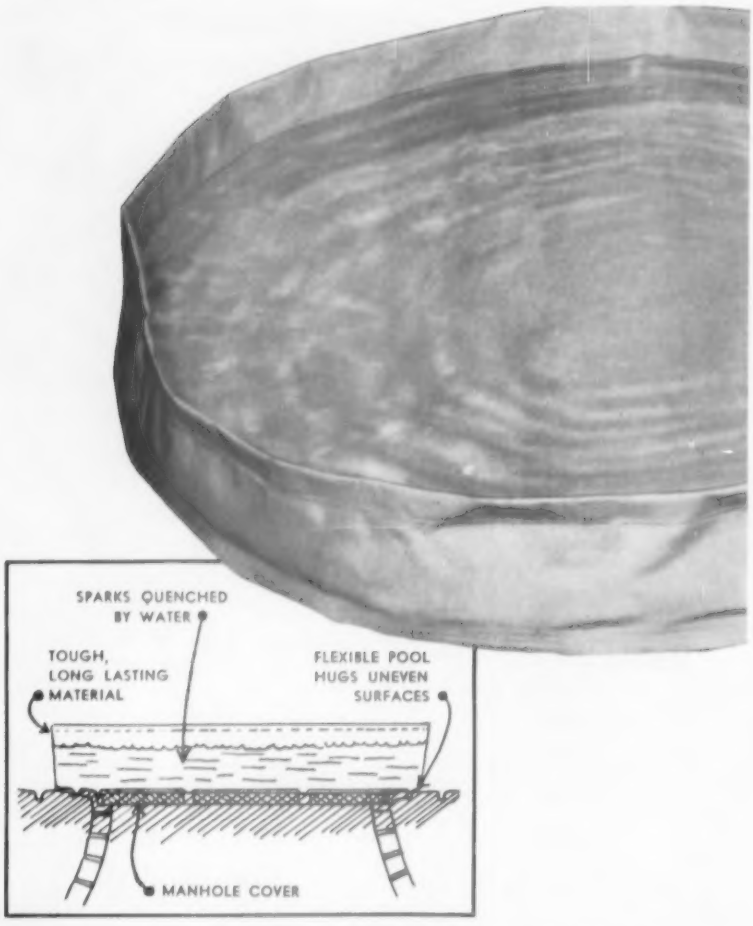
Now too, you can get this easy to operate Fyr-Fyter extinguisher in a sparkling, enduring chrome finish that won't tarnish or discolor. It retains its modern appearance through years of reassuring protection. A beautiful baked red enamel that won't crack or peel is also available.

New improvements add to ease of operation. Just point extinguisher at fire and press lever. Squeeze lever is longer and stronger, fits heel of hand better. Larger nozzle orifice spreads 60° wide angle blanket of fire-killing chemical which smothers fire faster with its 10-12 ft. long stream.

Write today for complete information

Fyr-Fyter

DIVISION OF THE FYR-FYTER COMPANY
221 CRANE STREET . . . DAYTON, OHIO
Branches: New York, Boston, Philadelphia, Chicago, Atlanta, Dallas, San Francisco, Los Angeles, Portland, Seattle
REPRESENTATIVES IN PRINCIPAL CITIES



A new way to prevent sewer explosions from welding sparks

Here's the fast, two-step way to prevent explosion of gases trapped in manholes.

1. Unfold Safety Pool (it folds down to newspaper size for easy carrying) and lay it over manhole cover.
2. Fill pool with water and weld without fear of explosion.

Sparks or globules of molten metal fall into water and are extinguished. There's no chance of charring through fabric.

Weight of water hugs pool to ground without using bricks or makeshift weights. Since fabric is flexible, it follows contours of manhole cover.

Highly abrasion resistant fabric is StaSafe Gra-Lite compound on glass cloth base material. **Neither Gra-Lite nor glass cloth support combustion.** Pool is also completely watertight. All seams are armored (Gra-Lite fused over seams).

The Manhole Cover Safety Pool sets up in seconds **without** any tools. It lasts longer, gives better protection and uses water for the big explosion prevention job.

Write today for bulletin on Manhole Cover Safety Pool.

STANDARD SAFETY EQUIPMENT COMPANY
232 WEST ONTARIO STREET CHICAGO 10, ILLINOIS
NEWARK 4, N. J. 597 BROADWAY
CLEVELAND 10, OHIO 855 EAST 152nd ST.
LOS ANGELES 66, CAL. 12921 W. WASHINGTON BLVD.

For normal room temperatures up to 100 F., ordinary sprinklers are used. Where temperatures are higher, thermometer readings should be taken near the ceiling and ratings selected accordingly.

In the few cases where sprinklers have failed to function when needed, the fault has rarely been due to the sprinkler mechanism. Deficient water supply, freezing, defective dry-pipe valves, foreign material in the system, corrosion, obstruction of sprinkler heads by stock piles, or paint on sprinkler heads are among the causes.

Wet-pipe systems are used for most installations. Water to sprinkler heads is maintained under pressure and operation is immediate. This type can be used only when pipes are protected against freezing.

Dry-pipe systems are used where there is danger of pipes freezing. Instead of water, air under pressure is maintained in the pipes. Opening of a sprinkler head releases air pressure, resulting in operation of a valve admitting water to the system. There is a slight delay between opening of sprinkler head and discharge of water.

After a fire, sprinkler heads should be replaced promptly.

Sprinkler Supervision

Flow of water in the system can be used to sound an alarm for fire and accidental leakage. The alarm check valve installed in a sprinkler riser can ring a hydraulic gong or an electric bell, or both.

A less expensive type, the water-flow indicator, is a paddle-like vane projecting into the piping. An electric bell sounds when the vane is deflected by flow of water.

Water-flow alarms are desirable where building contents are susceptible to water damage. They are useful supplements to watchman service.

Where central station supervisory service is available, water-flow alarms are transmitted to headquarters, which calls the fire department and sends a man to the plant to investigate.

Special Systems

For special risks, automatic systems employing carbon dioxide, foam or water spray nozzles may be installed.

Carbon dioxide is desirable where the system operates in an enclosed space and value of contents is high and subject to water damage. Carbon dioxide can be discharged either manually or automatically by means of heat-actuated devices.

Devices also close shutters, doors, windows and dampers and stop blowers to confine the extinguishing gas. These systems are suitable for spaces containing electric equipment or flammable liquids.

Foam installations are suitable for tanks and operations involving flammable liquids, but not for electric fires. They usually operate automatically, with provision for manual operation.

Water spray systems are used to protect oil-filled electric equipment, such as transformers, oil switches and oil piping and open tanks of flammable liquids. Water-spray systems require expert installation.

Other systems for limited and specialized occupancies use vaporizing liquid, steam and inert gases. For processes like paint dipping and tank operations using flammable liquids a manually or automatically operated cover is an effective means of extinguishment.

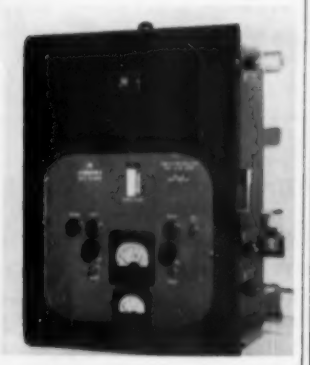
Obstructed Piping

A plant's fire protection may be crippled in an emergency when scale, stones or other foreign material become lodged in the sprinkler system. Should a fire occur, discharge from the sprinkler heads would be insufficient to check the blaze.

Regular examinations can determine whether the system contains an excessive amount of foreign material. Methods include observations of flow from the test connection on top of the system, drain tests at sprinkler risers, or hydrant flow tests.

Uncoupling piping at strategic points and examining the interior, or test flushing representative feed or branch lines, will reveal obstructions. Examination may show individual sprinklers to be clear, but that does not necessarily mean the branch lines are. * * *

J-W Model RV Alarms sample and analyze air from 2 to 8 separate locations in sequence on a 30-sec. cycle. Recording instruments and explosion-proof construction available on special order. Applications: chemical process industries, sewage treatment plants, laboratories.



J-W Model SM Alarm continuously samples one location, indicates quantity of combustible gas present, alarms at a pre-set level. Typical installations: drying ovens, fuel piping systems, chemical labs.

There's a J-W Combustible Gas Indicator and Alarm for every industrial need!

Manufactured by pioneers in the safe handling of combustible gases, the equipment pictured offers positive indication of hazards encountered under ordinary conditions in many industries. J-W equipment, the result of more than 25 years of development, assures unequalled reliability, convenience, and economy. If a problem calls for special equipment, Johnson-Williams will build it. There are no substitutes for safety or for the finest in safety devices.

←

J-W Model G Portable Indicator for sampling in confined and inaccessible areas. Easy sample drawing; automatic battery shut-off switch; weighs slightly over 4 lbs.

J-W Model EE Alarm serves same purpose as Model E but is mounted in an explosion-proof housing so entire instrument may be located in hazardous area.

J-W Sentinel Portable Audible Alarm maintains continuous watch for build-up in combustible gas. Ideal for hot work in confined areas: welding or repairs on tanks, piping in trenches, etc.

J-W Model E Alarm detects explosive gases in a single location or area. Control box mounts remote from sensing unit. Inexpensive, versatile.

Write for details on any or all instruments and where to buy it.

J-W **JOHNSON-WILLIAMS, INC.**
PALO ALTO 2, CALIFORNIA

Over 25 years of leadership in explosion prevention

Organization and Training For Fire Safety

ORGANIZATION and training before the emergency pay off when the need arises. Men who have been drilled until the right procedure becomes automatic can be expected to perform their duties under stress.

An adequate program requires thorough inspections, competent maintenance, and expert supervision of equipment and men.

Fire protection in many plants is a responsibility of the safety department. Even in larger plants where there is more specialization the safety department has an important part in the program.

Functions of an employee fire safety organization are threefold:

1. To detect and correct fire hazards—to prevent fire before it starts.
2. To maintain fire equipment for efficient action.
3. To become proficient in use of extinguishers and other fire-fighting methods.

The fire-fighting organization may consist of a few trained employees with hand extinguishers or it may be a company fire department with full-time personnel. Regardless of its size, the municipal fire department should have a prominent place in plant protection plans.

City firemen should be familiar with the plant layout, its fire-fighting resources, and its hazards. They can also help in training and equipping the company's fire fighters.

A plant should not depend on the city fire department alone. Even under favorable conditions, it takes time for outside apparatus to reach the fire, and in many emergencies, the department might be busy elsewhere.

Civil defense. The plant protection force should also be trained for its part in civil defense activities and peace-time emergencies. In many disasters

where communities have suffered from wind, flood and fire, industrial protection and medical resources have rendered notable service.

Fire squads may consist of 5 or 6 men in each department. They act as inspectors, reporting and, where possible, correcting fire hazards. They should be taught by actual demonstration on small fires to use extinguishers. They should also be impressed with the importance of turning in alarms promptly.

Trained men keep their heads in emergencies. They put out many fires before serious damage results and also help prevent panic.

Fire brigades. For larger plants, hydrants and hose systems are basic protection. Trained men are needed to use them. Members of department squads can be members of the plant fire brigade.

These men should be familiar with the plant, its protective systems and water supplies. They should be drilled frequently in handling hose streams—no job for an amateur.

Each man should have a definite task. Some should be assigned to protecting goods and machines from water damage.

Fire departments. Some plants have full-time motorized fire departments. The department supervises the plant protection program and is trained in specialized fire-fighting methods.

Any fire protection program should operate on a 24-hour basis.

Watch service. Watchmen are indispensable in protecting industrial property. They discover and correct fire hazards, detect outbreak of fire, extinguish incipient fires, and summon help when needed.

The watchman should be a mature, able-bodied man who is loyal and dependable. When the regular working force is absent, the safety of the plant may depend on him.

The watchman should be familiar with all parts of the fire protection system, including sprinkler system, drains and fire pumps. He should know how to operate extinguishers.

Recorded hourly rounds are recommended. Approved watchclock or supervisory systems record calls at each station.

Many fires occur just after a plant has closed down. The watchman should make his first round immediately after operations have stopped.

Training Fire Fighters

Essentials of training, as recommended by the National Fire Protection Association, are:

1. Officers and firemen should be kept fully informed on all phases of fire prevention and extinguishment. They should be encouraged to attend drill schools of the local fire department, or a fire college. Books, pamphlets and magazines are available. The rapid development of industry constantly brings new fire hazards and extinguishing methods.

2. Drills should be held at least twice a month during paid time. Location of drills should be changed each time, so that men will become familiar with all conditions and areas of the plant and be able to cover any emergency that may arise.

3. Drills should include making hose connections with hydrants, unreeling and stretching hose without kinks, coupling and uncoupling, attaching play pipes, carrying hose up ladders, over roofs and through the interior of the building.

As a general rule, water should be turned on for all outdoor prac-

The AMAZING New

AMERICAN LAFRANCE

DRY CHEMICAL FIRE EXTINGUISHER

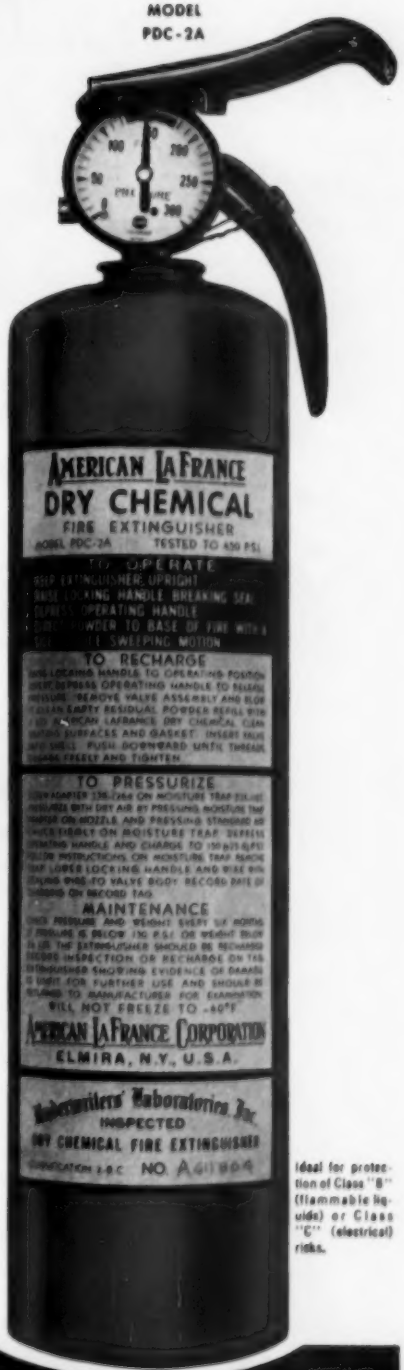
- Packs the same rated fire killing power of *FOUR* 1 qt. vaporizing liquid types.
- For INDUSTRY or HOME
- HARMLESS
- NON-TOXIC
- NON-CORROSIVE
- EASY TO USE
- EASY TO RECHARGE

Model PDC-2A can be quickly and easily operated with one hand.

When fire hits, this new Dry Chemical Model is already pressurized, ready to go. Simple to operate . . . just pull up on the carrying handle to break seal, depress operating lever and a penetrating cloud of Dry Chemical instantly smothers the blaze. Simple to service. A glance at the pressure gauge indicates its readiness. Complete instructions for recharging and pressurizing on the label. Built with the same quality materials and craftmanship as large American LaFrance units protecting industry and municipalities the world over.

• *Approved and rated by Underwriters' Laboratories* •

MODEL PDC-2A



Ideal for protection of Class "B" (flammable liquids) or Class "C" (electrical) risks.

AMERICAN LAFRANCE CORPORATION

ELMIRA, NEW YORK, U. S. A.

IN CANADA: LAFRANCE FIRE ENGINE & FOAMITE LTD. TORONTO

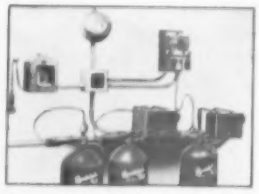
Shuts Doors, Windows, Stops Conveyors Sounds Alarm...

KILLS TOUGH FIRES!

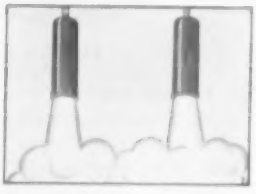
Randolph

EXTINGUISHING SYSTEMS

A fire! And the sensitive detector sends current to an alarm and storage tanks!



Doors and windows close . . . conveyors stop *automatically*. Powerful carbon dioxide pours through the feed lines.



Giant-size "CYCLONE" nozzles deliver the fire-killing punch . . . flood the entire room in 15 seconds!

Where your fire hazards are severe and areas are large or inaccessible . . . play safe! Be ready and secure with a *fast action* Randolph Automatic Fire Extinguishing SYSTEM!

At the first spark or flicker of flame . . . hundreds of pounds of powerful, non-damaging carbon dioxide flood the entire area . . . reach into every corner . . . stop the toughest fire . . . *all* automatically . . . *all* in a few seconds!

Thermostats set off alarms and immediately release a fire killing charge of CO_2 from stored cylinders through pipelines to overhead nozzles . . . the CO_2 charge smothers the fire with a heavy snow blanket. This charge can also shut doors, close windows, shut off motors, fans, conveyors, gas lines and close ducts . . . all automatically.

Send for Randolph's free FIRE HAZARD INDEX recommending the correct equipment for protection against any of the 580 typical fire hazards that might exist on your premises. Randolph's System Engineering Service is also available without cost or obligation. Write today: Randolph Laboratories, Inc., 2 E. Kinzie St., Chicago 11, Ill.

tice work, except during freezing weather. (This assumes rubber-lined hose; unlined linen hose should not be wet.)

4. Drills should be disciplined, moderately paced, and accurate.

5. Members of the brigade should be examined regularly to make sure they know the location of fire alarm boxes and the meaning of various fire alarm signals. * * *

Flammable Liquids

FLAMMABLE LIQUIDS, as defined by the National Fire Protection Association, are those which give off flammable vapors at or below 200 F. They are divided into 3 classes:

Class I. Below 20 F. Ethyl ether, acetone, carbon disulfide, gasoline, benzol, collodion.

Class II. 20 to 70 F. Amyl acetate, ethyl alcohol, toluol, ethyl acetate, varnish.

Class III. 70 to 200 F. Stoddard solvents, kerosene, amyl alcohol, creosote oil, turpentine, fuel oil.

The flash point of a liquid is the lowest temperature at which it gives off enough vapor to form explosive mixtures with air which are capable of propagating flame when ignited.

Portable containers. Safety cans, painted red, with self-closing spouts and flame-arresting screens should be used for Class I and Class II liquids. If several varieties of liquid are handled in a department, stripes or distinctive lettering should be placed on the can to prevent accidental mixing.

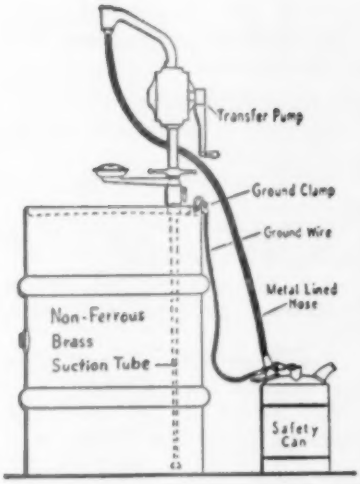
The following labels are recommended:

1. Flash point below 20 F.—DANGER! — EXTREMELY FLAMMABLE—Keep away from heat, sparks and open flame. Keep closed when not in use.

2. Flash point 20 to 80 F.—WARNING! FLAMMABLE—Keep away from heat, sparks and open flame. Keep closed when not in use.

3. Flash point 80 to 150 F.—CAUTION! COMBUSTIBLE — Keep away from heat and open flame. Keep closed when not in use.

Static electricity. Points of danger are at the outlet of a flammable liquid fill pipe, at a deliv-



SAFEGUARDS in handling flammable liquids: ground wire with clamps connects drum and container being filled; approved pumps are self-priming and equipped with flame arresters and protected openings for pressure and vacuum relief.

ery hose nozzle, near an open container, and around a tank truck fill opening or barrel bunghole.

To prevent static sparks during filling, a wire bond should connect storage container and container being filled. The bonding wire or receiving container should be grounded.

Tank cars, storage tanks, tank trucks, connecting pipes and hose lines and filling nozzles should be interconnected with bonding wire before attempting to open connections during loading or unloading.

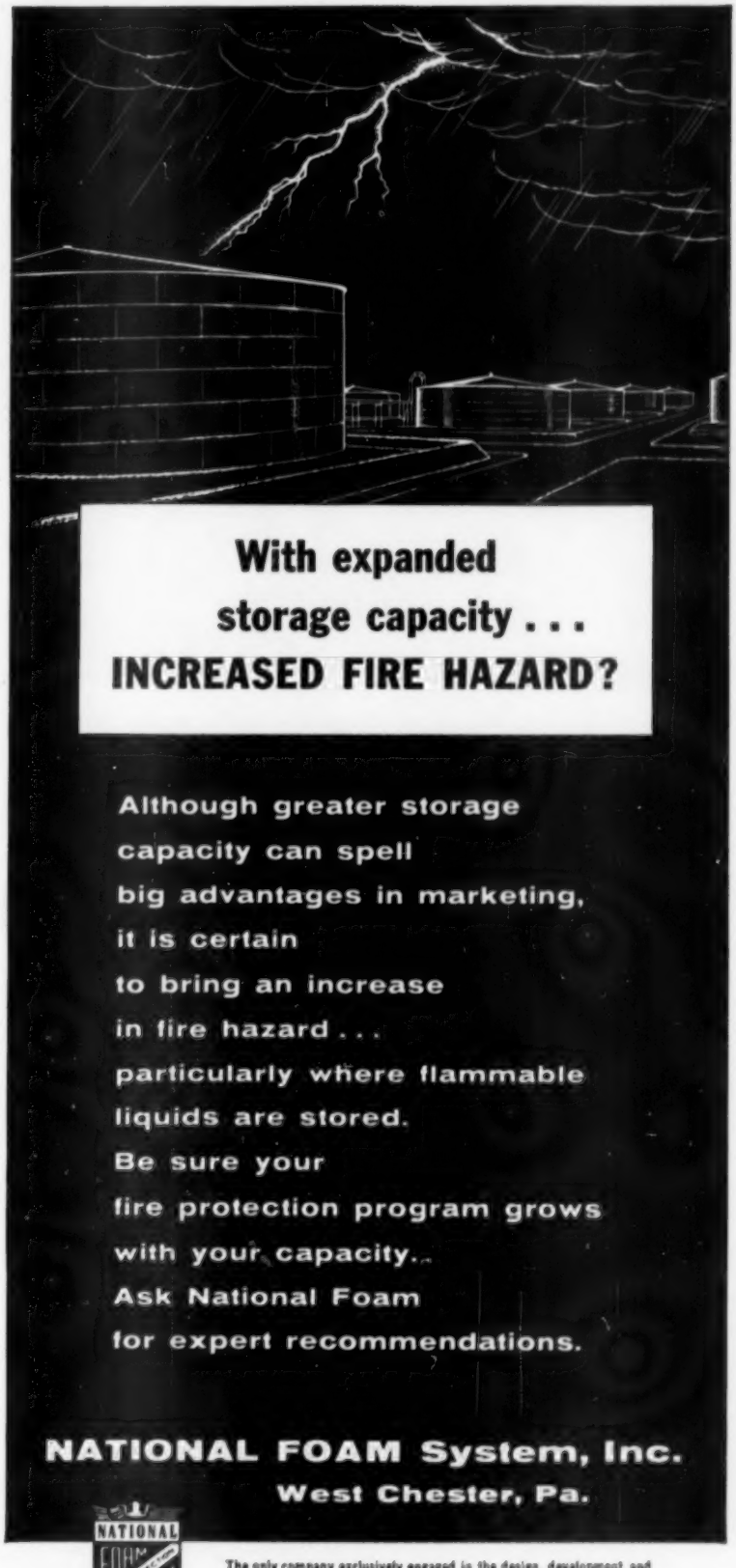
When pouring from one container to another, the lip of one container should rest on the edge or lip of the other. The receiving vessel should rest on a grounded surface. The two should be kept in contact during pouring.

Storage tanks above ground, not in contact with moist earth or connected to grounded pipe lines should be grounded. Grounding wire should be uninsulated.

Electrical equipment. For Class I hazardous locations, explosion-proof electrical equipment is specified by the National Electrical Code.

Wiring should be in rigid conduit, with fittings approved for explosive atmospheres.

Transfer pumps of approved de-


With expanded
storage capacity . . .
INCREASED FIRE HAZARD?
Although greater storage
capacity can spell
big advantages in marketing,
it is certain
to bring an increase
in fire hazard . . .
particularly where flammable
liquids are stored.
Be sure your
fire protection program grows
with your capacity.
Ask National Foam
for expert recommendations.
NATIONAL FOAM System, Inc.
West Chester, Pa.
NATIONAL FOAM SYSTEM
The only company exclusively engaged in the design, development and manufacture of foam fire protection equipment and chemicals.

sign should be used where quantities of flammable liquids are handled. These pumps are self-priming and equipped with flame arresters and protected openings for pressure and vacuum relief.

Combustible gas indicators are available for testing for various gases and vapors including carbon monoxide, hydrogen sulfide, benzol and for oxygen deficiency. An indicator should be used only by an experienced person and the manufacturer's instructions should be followed. * * *

How Does Your Fire Protection Rate?

Fire Doors

Are self-closing devices in good working order?

Do fire doors close easily and automatically?

Are doors kept clear of stored material and other obstructions?

Are doors and metal coverings in good condition?

Electrical Equipment

Are fuses of correct size applied to all circuits?

Has all temporary wiring been eliminated?

Are light bulbs kept clear of combustible materials?

Are oil switches and circuit breakers in good working condition?

Has dielectric in transformers and switches been checked?

Are electrical grounds and lightning protection satisfactory?

Fire Appliances

Is every fire extinguisher properly charged and tagged?

Can extinguishers be reached quickly?

Has defective or missing equipment been replaced?

Do outside hydrants drain so as to prevent freezing in winter?

Will all fire hose stand necessary pressures?

If you have a truck, is it ready for immediate use?

DON'T GAMBLE WITH SAFETY

GET MORE PROTECTION WITH THE GILBARCO ELECTRONIC INDICATING GROUND

Wherever highly volatile liquids are loaded – bulk plants, tank farms, or terminals – be sure of proper grounding. Install the Gilbarco Electronic Indicating Ground.

POSITIVE—Establishes ground and indicates its safety by either light or audible signal.

SAFE—Reveals faulty grounds caused by cable defects, paint, corrosion or carelessness which lead to fires.

SIMPLE—Gilbarco's electronic ground is easily installed in any grounding circuit. Furnished complete with clamp and cable.

UL

Gilbarco

Gilbert & Barker Manufacturing Company
West Springfield, Mass.
Toronto, Canada

Store Safely

• gasoline • kerosene
or any flammable liquid!

protects against dangerous explosions!

The Vent-A-Drum *prevents* dangerous explosions which occur from fires and sudden temperature changes when storing flammable liquids, by automatically allowing air to enter or escape container. In addition to protecting property and lives, Vent-A-Drum pays for itself by reducing fuel evaporation 50%! Used by leading firms, approved by Factory Mutual Testing Laboratories. Precision-engineered, never requiring adjustment or replacement of parts. Cast Bronze. Completely guaranteed. Order today directly from manufacturer. Only $22.50 ea., postpaid. Send Check, Cash or M.O.

Dealerships and literature available.

CENTRAL
Safety Equipment Co.
6613 Marsden St.
Philadelphia 35, Pa.

Clean Up

Is all dipping equipment cleaned regularly?

Are trash and flammable materials quickly and safely disposed of?

Are metal trash receptacles used?

Is excelsior and similar material kept in fire-resistant containers?

Auxiliary Firemen

Are auxiliary firemen well trained? Do they drill often?

Does your fire department maintain regular fire inspections?

Is responsibility for fire protection properly delegated?

Are firemen equipped with all necessary supplies?

Do firemen keep up with the best fire-fighting methods?

Is the public fire department familiar with your plant?

Spontaneous Ignition

SPONTANEOUS IGNITION is a chemical action in which there is a slow generation of heat from oxidation of combustible material. Under certain conditions, oxidation is accelerated until the ignition temperature of the material is reached.

This condition is reached only where sufficient air for oxidation exists but not enough ventilation to carry away the heat as it is generated.

Acute cases occur suddenly and explosively; in **chronic** cases heat generates slowly until ignition takes place.

Examples of substances subject to ignition are dry yellow phosphorus, which ignites on exposure to air, and quicklime, sodium, potassium and calcium carbide, which heat when exposed to moisture.

Some materials may be stored for long periods, processed, packed and shipped with no signs of heating. The first warning may be the discovery of smoke. Uncertainty increases the hazard.

Before spontaneous ignition can occur there must be combustible material, moisture, oxygen and a certain minimum temperature. Presence of impurities in the com-

BUFFALO
carbon dioxide
EXTINGUISHERS
with squeeze grip valve

INSURE INSTANT, DEPENDABLE PROTECTION!

Reach for a Buffalo Carbon Dioxide extinguisher, you're sure of instant, sure-fire action! Each extinguisher is designed to give rugged, dependable service and maximum protection against all hazardous flammable liquid and electrical fires. Operation is extremely simple . . . just point the horn as close to the base of the flames as possible, pull the lock pin and squeeze . . . instantly a clean, odorless, inert carbon dioxide gas is expelled under pressure and snuffs out the flames in seconds!

Buffalo Carbon Dioxide extinguishers are available in 2½, 5, 10, 15, 20, 50, 75 & 100 lb. models, and bear Underwriters' Laboratories, Factory Mutual and Coast Guard approval.

Buffalo squeeze grip valve with open lock, standard on all hand portable carbon dioxide models.

Buffalo's special squeeze grip valve insures instant operation, no lost time or carbon dioxide. They are positively leak-proof and are equipped with a safety disc and recoil preventors for added safety.

BUFFALO FIRE APPLIANCE
CORPORATION
DAYTON 1, OHIO
ESTABLISHED 1895

ORDER BUFFALO FIRE PROTECTION FROM YOUR INDUSTRIAL DISTRIBUTOR TODAY!
he's listed in the yellow pages

BUFFALO better-built

the right extinguisher for every fire hazard . . . plus a complete line of brass goods and hose

bustible material may affect heating.

At ordinary temperatures some combustible substances oxidize slowly and under certain conditions reach their ignition point. These include vegetable and animal oils and fats, coal, charcoal, and some finely divided metals.

Rags and waste saturated with linseed oil or paint often cause fires. In such instances a large surface of combustible material is exposed without means of escape for generated heat.

Best preventives are either total exclusion of air or good ventilation. With small quantities of material, the former is practicable. With large quantities, such as storage piles of bituminous coal, both methods have been used.

Temperatures above 140 F. are considered dangerous in coal piles. If temperatures rapidly approach or exceed that figure, it is advisable to remove the pile or rearrange it to provide better circulation of air.

Agricultural products susceptible to spontaneous ignition include sawdust, hay, grain, jute, hemp and sisal, especially if exposed to heat or to alternate wetting and drying. Circulation of air, removal of external sources of heat, and storage in smaller quantities are desirable precautions.

Fires in iron, nickel, aluminum, magnesium and other finely divided metals are sometimes attributed to spontaneous ignition. This is believed to result from oxidation of cutting or lubricating oils, or possibly from chemical impurities.

Materials like unslaked lime and sodium chlorate promote spontaneous ignition, particularly when wet. Such materials should be stored in a cool dry place away from combustible material.

Detailed procedure for prevention and extinguishment of fires in material subject to spontaneous heating is found in National Board of Fire Underwriters publications, *Preventing and Extinguishing Fires in Soft Coal*, Bulletin No. 30, and *Spontaneous Ignition and its Prevention*, Bulletin No. 51.

The New Flo-master Hand Pump
for cleaner, safer, easier liquid handling
★ EASY PUMPING
★ HIGH CAPACITY
★ CORROSION-RESISTANT CONSTRUCTION
★ SELF-PRIMING WITH HIGH SUCTION LIFT
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FLO-CHECK®
An inexpensive delivery registering device — optional and easily attached.
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Provides for the "drain-back" of liquid (after each pumping operation) from the pump chamber and discharge fittings.

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INDUSTRIAL, HAND AND TRUCK PUMPS, STRAINERS, PRESSURE CONTROL VALVES

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Static Electricity

STATIC ELECTRICITY is particularly dangerous in atmospheres where there may be flammable vapors, gases or dusts. Sparks resulting from static accumulations are a common source of fire.

Static charges result from:

1. Friction between small particles.
2. Contact and separation of two unlike substances, one or both of which are nonconductive.

Humidity. Cold, dry weather is most hazardous. A warm, humid atmosphere helps to draw off static charges.

Gasoline and other flammable liquids flowing through hose, or dust-laden air through nonconductive passages, may produce static charges.

Belts and shafting. Static charges are generated on dry belts (particularly rubber or leather) by contact and separation of belt and pulley. Accumulations can be controlled by use of conductive rubber belting.

Belts can be grounded with sharp-pointed metal combs or metallic tinsel static collectors which are grounded.

Where highly flammable vapors may be present, chain drive or conductive rubber belts with metal pulleys, rather than combs, should be used.

Conductive rubber belt dressings, if renewed frequently, are helpful.

Powdered materials. Finely divided materials falling through the air or blown through pipes may generate static electricity and ignite explosive mixtures of dust and air. Machines should be bonded and grounded at several points.

Humidity maintained at or above 60 per cent at 70 F. helps to prevent accumulation of static charges. High humidity is obtained by special humidifiers or steam jets installed on blower-type heaters.

Ionization of air also is used. Ionized air contains electrically charged particles which conduct static charges to grounded parts of machines. Ionization methods include gas flames, discharges of high potential electric current, and radiation from radioactive material. These methods require expert installation and maintenance and may involve fire or health hazards.

Body static charges may create a hazard in areas which contain highly flammable dusts, gases and vapors. Shoes with conductive soles and heels help drain off charges. Their conductive value is reduced by foot powders and by wool, silk or nylon socks. Cotton and rayon are safer.

Conductive floors should be installed in hazardous locations. Ordinary wax and other nonconductive floor finishes reduce the value of grounding measures. Special finishes for conductive floors are available.

Automatic sprinklers should be provided inside bins and processing equipment containing combustible materials. Where water is undesirable because of reaction with or damage to material, inert gas extinguishers may be used. * * *

Look for the Label

Approved extinguishers carry the label of Underwriters' Laboratories or Factory Mutual Laboratories. They also carry this information:

1. Type of extinguisher.
2. Type of fire for which it is recommended (Class A, B or C).
3. Instructions for use.
4. Unit rating.
5. Instructions for inspection and recharging.

An approved extinguisher must have adequate capacity. The vaporizing liquid type, for example, must contain not less than 1 qt. of extinguishing agent.

Wetting Agents

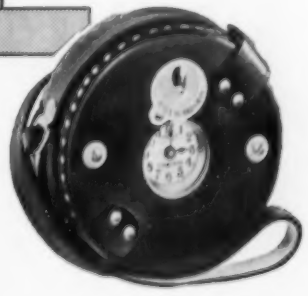
Wetting agents added to water increase its penetrating power. This "wet" water has proved ef-

Will your plant have a visitor next Week-end?

Uninvited weekend visitors account for the huge incidence of plant burglaries, vandalism and arson. A trained watchman knows how to handle such visitors. A trained watchman supervised by a DETEX tape-recording GUARDSMAN watchclock gives you full time protection—on weekends and holidays, as well as week days. Write for the vital facts.

FREE INSPECTION

Is your watchman's tour giving you maximum protection in light of recent plant expansion? Are your clocks adequate for the job? Are your register keys in good order, the station box screws properly sealed? It won't cost you anything to find out. Our inspector will be glad to make a free analysis to see that you are getting the protection you are paying for. Write or telephone for appointment.



Detex Watchclock Corp. 76 Varick Street, New York 13, N. Y.

☐ Please send me complete information about the GUARDSMAN tape-recording watchclock.

☐ You may send a DETEX representative to make a free, no-obligation survey of our plant protection needs. N-3

Name.....

Company.....

Address.....

.....Title.....

BRAND NEW!

INTRODUCING . . . A NEW JUMBO SIZE SIPCO DUNKING STATION

Specially designed for use in plants where SIPCO DUNKING STATIONS receive more than average use. Goes shift after shift without attention, greatly reducing cleanup time. Heavy duty cast aluminum canister with reenforced "fill level" bottom. Interchangeable with standard size canisters on any model SIPCO DUNKING STATION.

PRESENT SIPCO USERS! Order NEW JUMBO size canisters separately. They are interchangeable with your present standard size units.

UNIT No. 1J—Heavy duty cast aluminum JUMBO canister, attractive eye-catching metal sign, upright and heavy weighted base. 42" high, wt. 26 lbs.

UNIT No. 2J—Same as above except without upright and base. For mounting on walls, posts, columns or machines. Wt. 6 lbs.

UNIT No. 3J—(not illustrated)—Canister alone with mounting bracket.

WRITE FOR ILLUSTRATED FOLDERS

STANDARD INDUSTRIAL PRODUCTS CO.

DEPT. S • 920 N. GARFIELD AVE. • PEORIA, ILLINOIS

fective in extinguishing fires in dry, dusty materials, such as hay, decayed leaves in forests, peat, cotton bales and other lightly compressed materials. In such fires a penetrating action is needed and it cannot be obtained by the velocity of the extinguishing stream.

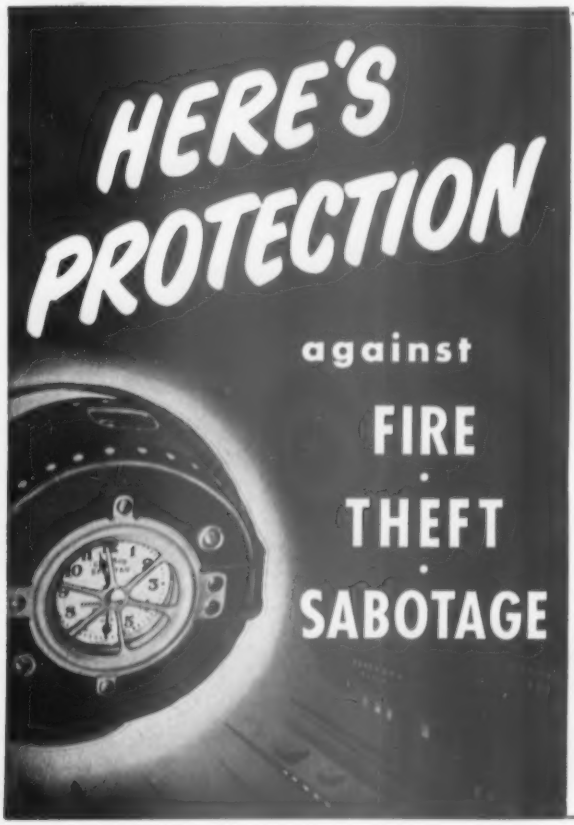
Wetting agent and water can be mixed in pump tanks and booster tanks. A proportioner is needed for use in hose lines.

Wetting agents have certain limitations. When used in hand extinguishers they may cause the stream to spray and reduce its range.

Inhibitors are used with agents to prevent corrosion of metal containers. For tanks, a lining of asphalt or other protective coating is needed.

Where to Smoke?

Smoking is a problem wherever people are employed, both from the standpoint of fire hazards and time taken off the job. But the



CHICAGO
Watchclock System

"The first . . . and still the first."

LOWERS YOUR INSURANCE RATES!

It keeps track of your watchman's tracks—so accurately and positively that the CHICAGO WATCHCLOCK System is approved by THE UNDERWRITERS' LABORATORIES and by THE FACTORY MUTUALS LABORATORIES. Users earn reduced insurance rates. Thus the CHICAGO WATCHCLOCK System quickly returns its small cost to you.

Write for FREE *new folder that completely describes this simple, low-cost, tamper-proof system of extra protection to property. Write for it NOW!*

CHICAGO WATCHCLOCK
DIV. GREAT LAKES INDUSTRIES, INC.
1524 S. WABASH AVE., CHICAGO 5, ILL.
OFFICES IN PRINCIPAL CITIES

habit is widespread and must be considered from the industrial relations angle as well as safety.

Where flammable materials are handled, smoking cannot be permitted. Where no fire or explosion hazard exists, management, supervision and workers can work out details.

Prohibiting smoking is not always the cure. Then, employees may sneak a smoke, perhaps in a hazardous spot.

A smoking area near the work place, with reasonable time for relaxation, has been the answer in many plants. Supervision is needed to prevent the relaxation from being overdone.

Receptacles for disposing of cigaret butts and pipe ashes should be placed at the entrance to any department where smoking is not allowed. In some hazardous areas employees are required to check matches and materials as they enter.

Chewing tobacco, while free from fire hazard, is objectionable from cleanliness and hygiene standpoints because of the inevitable accompaniment of spitting. In operations such as food processing, where scrupulous cleanliness must be observed, chewing tobacco is not allowed.

Cuspidors, a necessary evil, should be provided and cleaned regularly. Disposable cuspidors have obvious advantages in maintaining housekeeping.

Reserve Water Supply For Fire Fighting

Most people apparently consider public water systems infallible. And while their general record is excellent, they are subject to a variety of accidents which may suddenly put a plant entirely on its own resources.

Damage from floods, failure of obsolete equipment, freeze-ups and power failures have all occurred to hamper supply of public water.

In one case, a 30-in. supply main, sole link from a reservoir to an industrial city, broke, leaving plants without fire protection.

"Sounds for Safety" by Falcon®

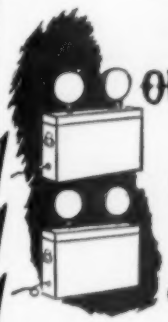
AUTOMATIC FIRE DETECTORS and ALARMS for round-the-clock fire protection. Self-powered unit gives early warning at first sign of fire. Easy installation, maintenance; 30 year guarantee, Underwriters Laboratories approved.

PORTABLE, NON-ELECTRIC, MANUALLY OPERATED SIGNAL HORNS — FOR INDUSTRIAL APPLICATION. Self-contained signal horns alert personnel over a large area at a flick of the finger — a FALCON horn for every industrial purpose.

HAND MODEL LONG RANGE PORTABLE SIGNAL HORNS WITH DISPOSABLE CANS — All new, big-voiced signaller can be heard over a mile at the touch of a trigger. Used — For the yachtsmen, sportsmen, industries, homes, etc.

For information write

FALCON ALARM CO., INC.
243 Broad St., Summit, New Jersey



DO YOU SPECIFY OUTDATED EQUIPMENT

WHEN YOU SPECIFY EMERGENCY LIGHTING? THE UNITS LOOK ALIKE But Only—

ONE is guaranteed for 5 years . . . both battery and unit!

ONE eliminates manually operated charger switches and timers.

ONE eliminates undercharged and overcharged batteries and premature replacements, cutting maintenance costs to the minimum.

ONE eliminates meters, messy hydrometers.

ONE unit can support 5 heads mounted remotely as desired.

ONE provides completely automatic operation that assures unfailing protection.

Be sure! Get the inside-the-box story before you specify. We will be glad to submit recommendations and quotations. Complete engineering service available. Catalog on request.

LIGHT WARDEN CHARGOMATIC

ELECTRIC CORD COMPANY
195-5 SPRUCE STREET NEW YORK 7, N.Y.

Big Beam

AUTOMATIC EMERGENCY LIGHTS

with Glass Jar Batteries

THE NEW Big Beam EXPLOSION-PROOF HAND LAMP

GUARD AGAINST

The Hazards of Sudden Blackouts

Big Beam Model 2ATW-GJ features a heavy-duty, 30-40-80 or 100 amp.-hr., long-lived, glass jar battery—especially designed for emergency lighting service. Built-in trickle charger and fast charger (with 12-hour automatic timer) keep battery charged at all times. Also available with nickel cadmium battery.

Sudden blackouts breed a multitude of hazards—confusion, panic, property damage . . . even death. Protect yourself from these costly hazards; install Big Beam automatic emergency lights by merely plugging in to existing lighting outlets. When regular lights fail, your Big Beam will provide many hours of bright, safe illumination.

Write for Complete Information

Model No. 287EX for use in hazardous locations, Class I, Group D

BIG BEAM BEACON LAMP

6570

U-C-LITE Manufacturing Co. 1027 W. Hubbard St., Chicago 22, Ill

IN CANADA: Bernard Marks & Co., Ltd., 70 Claremont St., Toronto 3, Ont.

Why INDUSTRY IS BUYING THE NEW EAGLE Safety Cans

the approved SAFE way to handle flammable liquids

1 qt., 2 qt., 1 gal. Safety Cans come with trigger-grip handle, as illustrated at top right. 2½ and 5 gal. sizes feature free-swing handle (above)

- A complete new line with a good old name
- Listed by Underwriters Laboratories
- Approved by Factory Mutual
- Available in 5 sizes from 1 qt. to 5 gal.
- No waste, no splash, no spill
- Strong quality construction
- Self-adjusting guard cap prevents leakage
- Safe for handling all flammable liquids

Order from your supplier or write for information. The new Eagle 1955 catalog showing the Complete Line is now available free. Eagle products are also available in Canada.

EAGLE MANUFACTURING COMPANY
Wellsburg, W.Va.

Serving Industry Since 1894

Long single mains are particularly vulnerable.

Drought-caused water shortages have been a recurring problem in many communities.

Growth of population and increased industrial activity are making supplies inadequate in some communities. While, in most cases, these conditions are remedied quickly, they present a problem which may be accelerated.

Water supplies to supplement a public water supply at a plant are furnished by gravity tanks, by fire pumps taking suction from open bodies of water or from tanks, and occasionally, by private gravity reservoirs.

These supplies must be checked often to insure reliability. Such a check should include levels in tanks and reservoirs, pressures in mains and sprinkler systems, and condition of fire pumps.

The less a man knows, the easier it is to convince him that he knows it all.

ENCOURAGE BETTER HOUSEKEEPING by installing

BUTT SNUFFERS

in all approved smoking areas

Discourages the habit of tossing cigarette butts on floors and into plumbing fixtures.

SNUFFS OUT Cigars Cigarettes - Matches

and destroys stale tobacco odors at the same time.

Fire engine red, baked-on enamel finish. Sturdy all steel construction. Comes in two sizes: MODEL No. 5 . . . 8" long, 5¼" wide, 6¾" high. MODEL No. 7 . . . 14" long, 7" wide, 8" high.

INEXPENSIVE TOO!

Write for FREE literature—dept. NS

BUTT SNUFFER SAFETY FLOOR PRODUCTS
3038 WEST 84th PLACE
CHICAGO 29, ILLINOIS

IN THIS SECTION

Medical and Health Service . 256

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Resuscitation Methods and Equipment 264

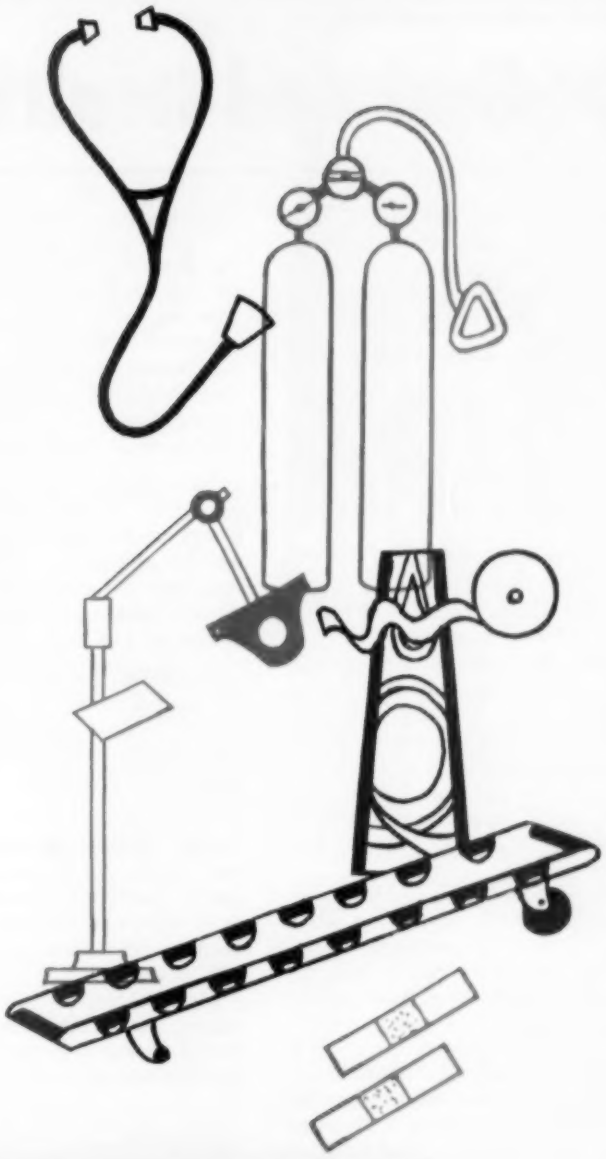
• • •

PEOPLE, no less than machines, need "preventive maintenance." The physician, the nurse, the layman trained in first aid, the industrial hygienist and the safety engineer are all on the same team.

Treatment of injuries incurred on the job still takes a lot of the medical department's time. It prevents many a minor injury from developing into a serious one and saves quite a few lives. But the main job is no longer patching up injuries the safety program failed to prevent.

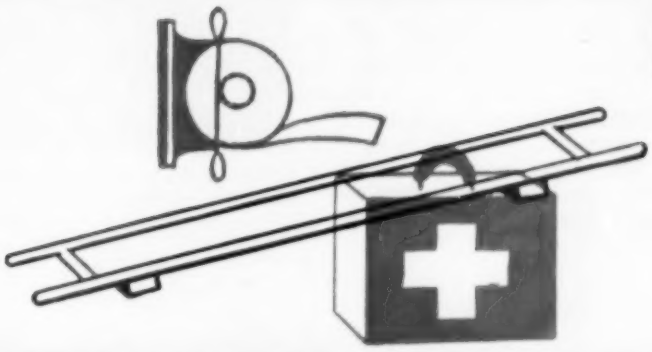
Preventive medicine has been of far-reaching importance to industrial development and to public health. Placement through physical examinations, health supervision of employees and studies of health hazards have been invaluable.

And in times of emergency, in peace or in war, industrial medical staffs will continue to serve their communities.



MEDICAL and HEALTH SERVICE

10



Medical and Health Service

INDUSTRIAL MEDICAL and health service provides a program of positive health maintenance for employees. This is accomplished through measures to provide:

1. A safe, healthful work environment
2. Medical services for emergency treatment of the ill or injured
3. Supervision of the health status of the individual through examination, counseling and placement
4. Health education
5. Observance of laws, regulations and codes for the protection of health

New processes and materials, with actual or potential health hazards, have brought additional problems and opportunities to the medical department. To study and control occupational health hazards, some large corporations maintain industrial hygiene laboratories.

Smaller companies obtain help from insurance companies, state departments, laboratories maintained by universities and research organizations, and private consultants.

Scope of Medical Program

Industrial medical service requires an organized plan. It must have management's full support but the program should be set up and operated by a physician who should be given considerable latitude in carrying out his methods and policies.

Essentials of the program are:

1. A staff of qualified physicians, nurses and attendants adequate for the organization.
2. Dispensary and hospital facilities conforming to standards established by the American Medical Association, American College of Surgeons and the American Association of Industrial Physicians and Surgeons.
3. Efficient care of occupational injuries and diseases.
4. Reasonable first-aid treatment for nonoccupational injuries and illnesses while on the job.
5. Physical examinations—preemployment and periodic.
6. Adequate records of treatments and individual medical histories. (The latter should be kept confidential.)
7. Supervision of plant sanitation and hygiene measures.
8. Instruction of employees in personal health and safety.

Industrial medicine recognizes the place of the private practitioner in providing medical care for the employee and his family and does not enter into competition where community medical resources are adequate.

Hospitals. Use of approved public hospitals, where available, is usually more desirable than setting up elaborate facilities for surgery and treatment of serious cases.

The medical director. Health and medical services should be under the supervision of a physician. Management and the medical director can formulate workable policies.

Medical assistants, consultants, nurses and others should be selected on the recommendations of the medical director.

A full-time physician may be warranted by size of the plant or nature of its operations. Sometimes a plant physician engages in private practice with the company's approval. He may devote part of his time to the industrial organization, assuming supervisory responsibility and delegating detail work to qualified assistants.

The nurse. The health program may require the services of many other professional people including the nurse, industrial hygienist, safety engineer, sanitary engineer and other specially trained persons.

Most industrial nurses are employed by companies which have single-nurse dispensaries and a part-time or on-call physician. She is assistant to the physician and his representative when he is not at the plant. She is also friend and confidant of the employees.

Where the nurse is the only full-time person in the dispensary, her duties include:

—Maintaining supplies and equipment.

—Providing first-aid care for injuries and emergency treatment of illnesses as authorized by the physician in charge.

MEDICAL SERVICE helps to provide a safer, healthier home-on-the-job for employees. Above are reception rooms and treatment booths at a modern plant hospital. (Diamond Alkali Co.)

—Assisting the physician with medical examinations.
—Participating in the health and safety program.
—Promoting health education and counseling employees on personal-health problems.
—Taking part in welfare activities.

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—Keeping adequate dispensary records. The nurse should not be burdened with paper work to interfere with her professional duties.
—Being familiar with the plant and its hazards through plant tours.

Cooperative services. Where several small plants are close together a cooperative medical service program can often be carried on. A central dispensary with necessary personnel and equipment is maintained. Adequate service can be provided at moderate cost.

Physical Examinations

Pre-employment examinations have become standard procedure in many companies. Their purpose is to place each employee in a job suited to his capacity rather than to bar anyone from a job.

Periodic checkups are desirable, particularly for elderly employees, for those in jobs where saftey depends on physical fitness, and where there is exposure to health-hazardous materials.

Examinations include vision, heart, chest, blood pressure, hearing and urinalysis. Tests in some industries require elaborate laboratory facilities and highly trained personnel.

Laboratories. For most industries, facilities for taking urine tests and blood counts are needed. Blood serum samples can be sent to a laboratory for analysis. Where a large volume of toxicological tests is conducted, a plant laboratory may be desirable.

Vision. Several devices for testing visual acuity and classifying workers for jobs are available. These devices can be used by trained laymen. Employees showing visual defects are referred to ophthalmologists or optometrists for further tests.

Hearing. By means of the audiometer, acuteness of hearing can be determined and treatment indicated. Any progressive loss of hearing, through noisy work or other causes, can be measured.

Chest. For many occupations, pre-employment and periodic examinations include chest x-rays.

EMERGENCY equipment in conspicuous location. Mounted on pillar are first-aid kit, stretcher, fire extinguishers and goggle-cleaning tissues. (Medical Supply Co.)

Mass chest surveys are made at regular intervals in industries where health hazards require frequent checks, and in public health campaigns to detect incipient cases of tuberculosis and cancer.

Trained technicians with mobile equipment can be engaged to conduct mass x-ray surveys.

Consultants

The medical director, like the private practitioner, is not an expert in all branches of medical sciences. Both find it necessary at times to call on specialists when diagnosis is uncertain or treatment requires specialized techniques.

Surgeons. In all surgical cases where there is danger of inaccurate diagnosis or inadequate treatment, outside consultation should be called in early. Frequently, the administrative and diagnostic ability of the medical director is more important than his skill in surgery. The plant physician should refer all cases which might be beyond his training and experience to a specialist or surgeon.

Oculist. One of the most frequent occupational injuries is to the eyes. The importance of one's eyesight justifies obtaining the highest available skill. Specialists should be summoned in all potentially serious cases.

—*To page 263*

Care of the Injured

PREPAREDNESS for accidents and sudden illness is essential wherever people work. It must include first-aid facilities that meet at least minimum standards and trained personnel who know what to do—and what *not* to do—when their services are needed.

Prompt and skilled treatment has prevented many minor injuries from becoming serious, thereby avoiding much lost time. Sudden attacks of illness may also occur on the job, and a layman who can administer first-aid treatment and get the patient to a physician often can prevent serious consequences.

A physician or nurse should treat injuries wherever possible. Companies which have trained large numbers of employees in first aid do not permit them to treat injured persons if medical service is available. Theirs is strictly emergency training.

However, most injury cases in the plant and outside are first handled by laymen and the minutes before the doctor arrives may be vital. Many a life has been saved because some person immediately stepped in to check bleeding, apply artificial respiration and treat shock.

Many laymen acquired first-aid skill during military service, and experience in combat showed the value of their training. Many civilians have been trained by the American Red Cross and the U. S. Bureau of Mines in the United States, and by similar organizations in other countries.

Adequate care of the injured requires:

1. Trained attendants
2. Clean, convenient quarters
3. Equipment and supplies that meet medical standards
4. Well-planned organization and procedure
5. Well-kept records

This discussion is concerned primarily with plants which must depend on trained laymen, or at most a full-time nurse and part-time physician, rather than those with medical staffs and hospital facilities.

The Staff. First-aid facilities should be under supervision of at least a part-time physician. A full-time registered nurse is desirable, even in a medium-sized plant.

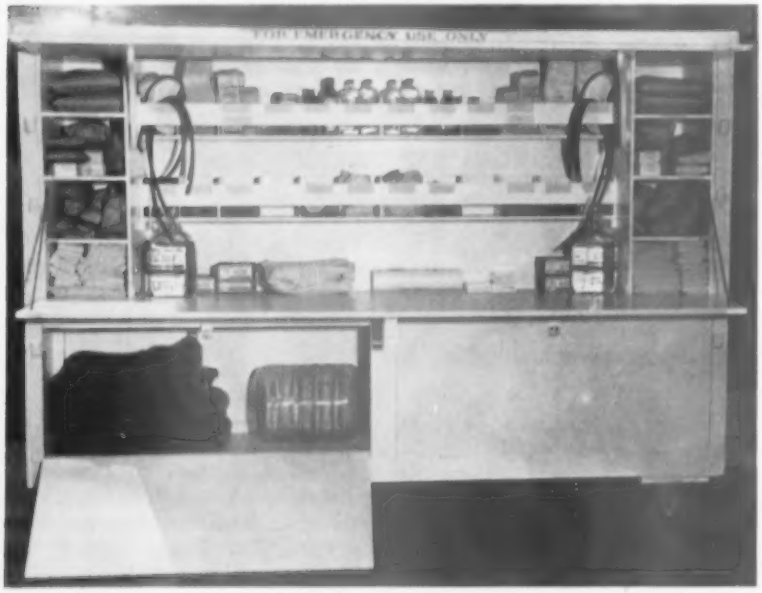
LOCATING and removing small particles from the eye is aided by this powerful magnifier.

If a full-time nurse is not practicable, at least two employees who have completed standard first-aid courses should be selected to carry on the work. They should be under supervision of a doctor or nurse.

Attendants should be allowed sufficient time from their jobs to maintain the first-aid room, check supplies and keep necessary records. An attendant should be available during working hours.

The Dispensary

A separate room should be provided, if possible. Patients should have reasonable privacy. If it is not practicable to partition the dispensary into a waiting room



MOBILE first-aid station for emergency use. Both sides of unit open up to provide access to supplies. Doors at ends open on cupboards where stretchers are stored. (Consolidated Vultee Aircraft Corp.)

References—Care of Injured

National Safety Council: Unit First-Aid Kits, Data Sheet D-202.

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—Patching Up Some Industrial By-Products; W. B. McCunniff, M. D., Feb. 1956.

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IN DAVIS D-CARTON UNITS

Thin, durable coating of finely perforated plastic bonded to highly absorbent, unoriented cotton keeps wounds and burns dry. Can be removed easily without sticking, without soaking.

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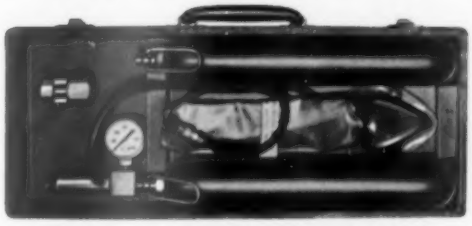

Weighs only 9 lbs., with up to a half hour supply of oxygen. Includes plastic facepiece and breathing bag, adapters, reducing valve. Easy to operate.

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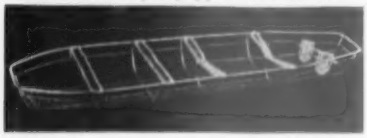
JUNKIN STRETCHERS

STRETCHER CASE

YOUR PLANT NEEDS STRETCHERS

The Junkin Stretcher Case affords a convenient and compact cabinet for storing the army type stretcher, blankets and first aid equipment. It provides a definite location for the equipment and protects it against the deteriorating effects of dirt and grime. And because it's compact it's a SPACE SAVER tool Comes fully equipped if desired.



JUNKIN SPLINT-TYPE STRETCHER

Construction permits patient to be carried horizontally or lifted vertically without danger from inaccessible locations. Canvas straps and footrests keep patient rigid and comfortable. For complete information write for free descriptive literature.

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101 S. FLOYD ST.
LOUISVILLE 2, KENTUCKY

and a treatment room, a screen can be use.

The first-aid room should have:

1. Good lighting
2. Adequate ventilation and comfortable temperature
3. Basin with hot and cold running water
4. Quiet location
5. Floors of durable and easily cleaned material
6. Toilet facilities

The first-aid room should be quiet, well ventilated and away from doors. Windows should be screened to keep out insects.

Furnishings should be simple and neat. The color scheme has an important influence on patients. And the trend is away from "hospital white." Walls painted with semi-gloss enamel in light tints of green, cream or buff are cheerful and easy to keep clean.

A patient who is nervous or in a state of shock may be upset still more by intricate patterns on walls and ceilings.

The floor should be resilient and easy to clean. Linoleum, rubber tile, vinyl tile and asphalt tile are practical for dispensary use. A sweeping compound, a vacuum cleaner with brush attachments, and damp or chemically treated cloths for dusting help to keep down dust.

Equipment. For a dispensary with a registered nurse in charge under the supervision of a part-time physician, equipment might include:

1. Two white enameled chairs and a bench
2. Enameled top table or desk
3. Stool
4. One or more beds or cots
5. Linen and blankets
6. Waste can with cover
7. File for medical records
8. Floor lamp
9. Treatment table and instrument cabinet
10. Medicine chest
11. Small sterilizer
12. Small items of office and surgical equipment, such as basins, pitchers, rubber gloves (sterile), scissors, tweezers, forceps, hot-water bottle or electric heating pad, ice bag
13. Stretcher
14. Telephone

First-Aid Supplies

The dispensary operated under full-time medical supervision will naturally carry a wider assortment of instruments and supplies, including many items not ordinarily used by laymen. If the first-aid room is staffed by nonmedical personnel, keep the setup as simple as possible.

The supervising physician should be consulted about selection of materials, particularly when medication is involved. He should select such items as first-aid antiseptics and burn dressings.

Unit first-aid material is replacing bulk first-aid supplies for smaller plants, for small groups detached from a central headquarters, men working in isolated areas where medical help is not available, and on trains, buses, trucks and airplanes.

Unit first-aid material is desirable for such groups because each dressing and treatment is an individual unit, for one-time use only. Materials can be kept in sanitary condition for long periods. There is more likely to be a sufficient quantity and wider assortment of bandages.

To simplify maintenance of industrial first-aid kits and to establish commercial standards for sizes of unit cartons and kits, the Division of Simplified Practice, National Bureau of Standards, has compiled Code R178-41 in cooperation with industry.

Kit sizes and their contents are determined by the number of persons to be protected, with consideration to the nature and frequency of injuries likely to occur. Kits come in 10, 16, 24 and 36-unit sizes. A 24-unit kit, for example, would be suitable for a group of 50 men.

Specifications outlined in Federal Specifications GGK-391 (Amended) are generally accepted and used by manufacturers in the production of unit first-aid material and kits.

For operations under federal regulation, assortments have been specified although these may not fit all local requirements. Contents of kits include:

Adhesive bandages
Burn compound
Burn solution

Petroleum gauze
Ammonia inhalants
Antiseptic swabs
Antiseptic applicators
Tincture green soap
Eye packets
Bandage compresses—2- 3- and 4-in.
Tourniquet
Forceps
Scissors
Triangular bandages
Gauze bandages
Gauze pads
Gauze compress
Adhesive tape
Aspirin or other analgesic
Soda bicarbonate tablets
Poison ivy ointment
Insect repellent

If the kit is to be used where poisonous snakes are likely to be encountered, a snake-bite kit should be included.

The unit system does away with many of the objections to first-aid kits but a competent and conscientious employee should be responsible for dispensing supplies. Employees may help themselves, often for home use, and supplies may not be replaced. Also, self-treatment should be discouraged.

For the smaller plant, ideal quarters for a first-aid station may not be available but the best possible spot should be chosen. It should be readily accessible to the working zone and convenient for supervision and maintenance.

A lavatory with hot and cold running water and toilet facilities should be available.

Reasonable privacy is desirable, both for the patient and for the possible effect on those working in the area. If a separate room is not available, a screen can be erected.

Equipment may be selected from lists suggested for dispensaries, keeping in mind limitations of space and requirements of the plant. The following are essential:

1. Desk or table for filling out reports and records.
2. Chair or stool.
3. Filing cabinet for records.
4. Waste can with cover.
5. Bulletin board.
6. First-aid manual.

Dispensary Records

Accurate records should be kept of treatments. If injuries are in-

check your snake bite kit now . . .

be sure your workers are provided dependable, instant first aid with the

IMPROVED SAUNDERS' SNAKE BITE KIT

Now's the time to carefully check each worker's snake bite kit to see that every detail is in order—everything is ready just in case! If you need more kits, remember this: The *Saunders' Kit* has the only venom-suction pump with a guarantee . . . does not have to be lubricated in the field . . . no glass to break. The only pump with three adapter sizes . . . easier to use, less discomfort to patient. Provides *instant* first aid with *controlled* suction that is increased as desired . . . and easily, quickly administered by the victim alone if necessary. Kit contains everything needed for emergency use . . . suction pump, adapters, tourniquet, lancet, bandages, antiseptic, inhalants, instructions. Order from your MSco distributor or write for data.

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Medical Supply Company

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frequent, a small day book may be sufficient, if kept systematically. Entries should include these details:

1. Date and time of injury.
2. Date and time injury was reported for treatment.
3. Name of injured.
4. Address of injured.
5. Where and how injury was received.
6. Names, addresses and telephone numbers of witnesses.
7. Nature of injury.
8. Kind of treatment given, and by whom.
9. Whether employee returned to work after treatment; if not, when.

First-Aid Antiseptics

Infection of an open wound can be prevented by killing germs already present or by removing them mechanically and preventing entrance of more. It is in this second theory that soap and sterile water are used in aseptic treatment of wounds.

Thorough washing with soap will mechanically remove organisms and a sterile bandage will prevent entrance of more. Few are destroyed in the process by ordinary soaps.

Germicides, including phenol and mercury compounds, have been used in soaps but their effectiveness requires too high a concentration for ordinary use. But results have been reported from hexachlorophene for general as well as surgical use.

Many substances will kill germs in a test tube but a first-aid antiseptic must kill them in the presence of body substances and not kill too many body cells at the same time. Choosing the proper one should be left to the doctor in charge.

Corrosive sublimate (mercury bichloride), for instance, is effective but injurious to tissues. Compounds such as merthiolate, merphenyl and mercurochrome are devised to get the antiseptic properties of mercury without its toxic effects.

The halogens (tincture of iodine and Dakin's solution) have been widely used because of their strong oxidizing action. They are even stronger than hydrogen peroxide, which is used for the same reason.

The various antibiotics (sulpha compounds, penicillin, terramycin) are not antiseptics, though they are useful in treating infections. They should be used only under medical supervision.

Transporting the Injured

Where there is any doubt about moving the patient, medical aid should be brought to the scene of the accident, if possible. Lifting a patient into a car may aggravate injuries.

Before the patient is moved he should be treated for possible shock. Fractures should always be splinted.

Stretchers. The army type is easy to handle. It can be used as a cot at the scene of the accident, in transit, and at the first-aid room or hospital. It is frequently stored in a canister in a conspicuously

CONTENTS — sterilized bandages, compresses, gauze of varying types and sizes, tourniquet, forceps, burn ointment, splint, iodine applicators, aromatics and related supplies.

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Cabinets contain supplies and accessories for instant application in burns, lacerations, eye injuries, gross bleeding, fainting, fractures, and allied injuries common to industry. Contents readily applied by average employee. Assures immediate relief for injured until medical assistance can be summoned.

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marked spot to keep it clean and ready for use.

Collapsible stretchers may be folded when not in use and carried in an automobile. Some are equipped with wheels and an adjustable head rest.

Bandages, splints and stretchers may be improvised in emergencies when regular equipment is not available. Improvisation is part of first-aid training. Where men are at work, however, approved first-aid equipment and supplies should be kept on hand.

First-Aid Training

The American Red Cross first-aid textbook and the U. S. Bureau of Mines manual of first-aid instruction are recommended for teaching first aid. It is often found that accidents are less frequent among persons trained in first aid and it is advisable to have as many employees as possible receive this training. * * *

Medical Service

—From page 257

Ophthalmologists and optometrists also can serve industry in correcting defective vision among employees. The employee should, of course, have the privilege of choosing his own refractionist, but frequently he will ask advice of the medical department on selection of a specialist.

Where prescription goggles are indicated, some companies provide the examination.

Dentists. Injuries to the teeth are relatively infrequent in industry. Such cases usually are sent outside for treatment. The medical department should have a list of dentists qualified to treat such injuries.

The importance of oral hygiene has led many companies to provide dental examinations, sometimes including full-mouth x-rays. Findings are usually referred to the employee's dentist since few companies provide restorative dentistry.

Health Agencies

Among agencies furnishing helpful data on general and specialized phases of medical service, first aid and industrial hygiene are:

United States Public Health Service

United States Department of Labor

American Standards Association

Industrial Hygiene Foundation

Atomic Energy Commission

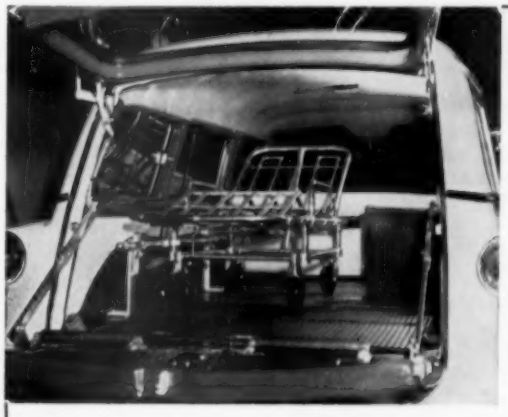
State and municipal health departments.

Mobile Clinics

A recent development in industrial health service is the mobile clinic which makes it possible to extend medical coverage to more employees.

The simplest type, which consists of a trailer towed behind a car or station wagon, is equipped to give some of the simpler tests.

Most elaborate is a bus-type vehicle housing facilities for visual, hearing and x-ray examinations. It is practically a self-sufficient medical department and laboratory on wheels.



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WASHINGTON MAKES A COMPLETE LINE of station wagon conversion cot and stretcher kits—with models available to fit any make or model wagon. Installation is simple, and removal is quickly accomplished in a few minutes—leaving the wagon floor clear. Washington cots and stretchers are the first choice for any emergency vehicle, as well as the favorite for emergency rooms, industrial first aid stations and plant hospitals. If you are in doubt as to the proper kit, write us giving the type and model of station wagon, and we will advise you of the most suitable model, with prices.

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Two-level elevating ambulance cot, Model 52—A Washington exclusive design.

Washington's COMPLETE LINE of ambulance cots and stretchers and other emergency equipment can meet your every requirement. For over 32 years, Washington has constantly featured the highest quality and best craftsmanship in the industry. First aid and rescue squads, fire departments, hospitals, factory hospital and first aid rooms are but a few of the thousands of satisfied users of Washington products.

Fold-A-Way emergency stretcher, Model 18. Light and compact, folds easily.

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Resuscitation

Methods and Equipment

THOUSANDS of victims of suspended breathing due to asphyxiation, drowning, electric shock and other causes have been saved by artificial respiration applied by trained persons.

The Arm-Lift, Back-Pressure (Holger-Nielsen) Method has been adopted officially by the American Red Cross and other organizations. It is widely used and has proved its value on many occasions.

The back-pressure hip-lifting method, proposed by John H. Emerson, is used by many industries and organizations as an official or alternative method. This method has advantages in near-drowning accidents because lifting helps to drain water from the stomach and air passages. It is also valuable for electric shock cases where burns of hands and face are common, and in other injuries where manipulation of the arms may be difficult or dangerous.

Pole-top resuscitation, used by public utility companies, has proved valuable in resuscitating victims of electric shock. Its use avoids the loss of vital time while lowering the patient from the pole. When he is on the ground another method is substituted.

These methods can be applied immediately without apparatus, which is important in all cases of suspended respiration. They are more efficient than the Schafer prone-pressure method which was widely taught for many years and saved many lives.

Mechanical resuscitators are used by fire departments, hospitals and some industries where asphyxiation or electric shock hazards are serious and where apparatus and trained personnel are available immediately.

Such apparatus can be used where injuries to the patient might prevent use of manual resuscitation. It also gives more air exchange and does not get tired.

Mechanical resuscitators are for use only by persons trained in their operation.

The inhalator, which supplies oxygen to the patient under low, continuously positive pressure, is used with manual resuscitation. It is particularly valuable in cases of gas asphyxiation and has become part of the equipment of fire departments and rescue squads. The inhalator by itself does not produce respiration and should not be confused with mechanical resuscitators.

Use of pure oxygen, rather than the mixture of oxygen and carbon dioxide formerly used, is recommended by the Council on Physical Medicine of the American Medical Association.

Some types of apparatus combine the functions of resuscitator, inhalator and aspirator, restoring breathing, administering oxygen and removing from the throat secretions which might hinder breathing.

Application of manual resuscitation should never be delayed while waiting for apparatus.

Know Your Snakes . . . And Be Prepared!

Snakebite, fortunately, is not one of the more common causes of injury or death in the United States. It probably ranks far behind protruding nails or slippery floors.

But if job or vacation takes you to a snake area, don't rely on statistics. Wear high boots or leggings and carry a snake-bite kit. And memorize directions for its use. The 100-proof cure is not recognized in medical circles.

Some persons actually like snakes. Most, however, have a strong aversion to them and an impulse to kill even the most harmless.

Snakes have been known to go out of their way to attack humans, but ordinarily a snake, either poisonous or nonpoisonous, will crawl out of the way if given a

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REECE ORTHOPEDIC SHOE
Wood Sole Acts As Splint
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BROKEN TOES and FOOT BONES—Burns —Bursitis—"Athlete's Foot"—Dermatitis—hastens healing, permits aeration.
Canvas upper—white or olive drab, laces easily over any size bandage.

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Sizes — Small — Medium — Large

Easily stocked—can be worn on either foot—no lefts or rights.
Guard prevents reinjury—

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Quickly and Reliably
if your employee is ill rather than suffering from a hangover.
Stop accidents by adding to your present procedure a simple accident must for determining intoxication.
THE HARGER DRUNKOMETER,
used nationally in industry, is the oldest and most widely used of the breath methods.
Write today for information and list of successful users. N-303.
STEPHENSON CORPORATION
RED BANK NEW JERSEY

chance. Any snake will fight if cornered.

Most snakes one is likely to encounter are nonpoisonous. There are only four poisonous kinds native to the United States. Three are found only in certain sections of the country. Only one is native to all sections.

Rarest of the poisonous snakes is the coral snake. It is semitropical and found usually in Florida, in the states bordering the Gulf of Mexico, and in desert areas of the Southwest. Its venom is the most deadly of any carried by North American snakes. A burrowing snake of nocturnal habits, it is infrequently seen.

The black-snouted coral snake is small and rodlike. Its seemingly headless body is banded above, below and all the way around by alternate bands of brilliant black and red, separated by narrower bands of yellow.

Akin to the cobra and mamba, the coral snake does not have fangs. Its teeth are grooved and venom flows into the wound by means of the grooves. A bite looks like a semicircular series of pinpricks. The quick-acting venom attacks the nervous system. Fortunately it carries a comparatively small charge of venom.

Other poisonous snakes are the cottonmouth moccasin, the copperhead and the rattler. These three are called "pit" vipers because of the pit or indentation between the nostril and eye. Theirs is a slow-acting venom whose full effect may not show up until several days after the bite. The venom attacks the victim's blood and is injected through the two hollow fangs.

Except for some types of rattlers which become 6 ft. long, pit vipers have short, thick bodies and stubby tails. Their heads are blunt and shaped somewhat like an arrowhead. Their necks are pronounced, as contrasted with the slimmer bodies, less pronounced necks and long, slim tails of the nonvenomous snakes.

The cottonmouth or water moccasin stays close to streams, marshes and swamps of Southern states. When surprised, it coils, draws its head back and opens its mouth wide, showing the white mouth parts; hence its name "cottonmouth."

The copperhead is an upland snake. Its habitat is the rocky cliffs that border streams of the Appalachian Mountains. It takes its name from the coppery color of the top of its head. It is sluggish, and often allows its victim to walk within striking range before it moves.

Some type rattlesnake is found in every section of the United States. There are a number of varieties of this snake, from the small prairie rattler to the 6-ft. diamondback. It usually, but not always, gives ample warning before striking. Don't count on it!

* * *

When a Person Falls

When a person falls, the first impulse of many persons is to help him to his feet. These well-meaning Good Samaritans can add to his troubles.

Even an apparently simple fall may result in a hip fracture. In such a case, unnecessary move-

THE ULTIMATE IN FIRST AID KITS

Whether you employ 2 people or 100 people, there's a Halco Industrial First Aid Kit for you!

Manufacturers for over 35 years, we have available over 100 different types of Industrial First Aid Kits: one of which would be ideal for your purposes.

Write today for a circular describing some of these Halco Industrial Kits.

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YOUR SAFETY — OUR BUSINESS

EMERSON Resuscitators

"Simplest and Safest"

SIMPLE to operate.

SAFE for adults, children, or infants.

ACCEPTED by the American Medical Association since 1942 for use *by laymen.*

PROVIDE SUCTION, alternating with pressure, to give vital aid to the circulation. Write for *free Medical References on Resuscitation.*

NOTE: The first few minutes after breathing has ceased are the most critical. Manual artificial respiration should be started immediately and continued until the resuscitator is in use.

For free bulletins, *Emerson Method of Artificial Respiration* and *Emerson Portable Resuscitators*

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"For maximum personnel protection in the use of x-rays and radioactivity

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Professional Service for Radiation Safety

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ment may displace the fragments or damage nerves, blood vessels, or muscles.

World War I taught an important lesson—that a wounded soldier should not be moved until it is certain that no bones are broken. In case of broken bones, the parts are immobilized.

If an ambulance can be obtained quickly, the attendants will know what to do. Inexpert lifting may lead to internal injuries, or possibly increase hemorrhage. Least desirable form of transportation is the back seat of an automobile. In the absence of an ambulance, a truck or delivery wagon will do, if available.

At the hospital, an x-ray will show the nature of the injury. The first aider's job is to keep the patient comfortable while restricting movement of the injured parts.

Fatigue Is a Factor In Accidents

The tired worker has been one of industry's problems for years. Long recognized as a destroyer of plant efficiency, fatigue is a factor that lurks behind many accidents. But fatigue from employment is a factor that is being reduced gradually.

The worker today is supplied with greatly improved equipment as compared with his predecessor's. He expends less muscular effort. Yet in spite of this he gets tired. Such fatigue is often caused more by psychological, physiological, and environmental factors than by physical exertion.

Studies have shown that accidents increase as the work day is extended beyond eight hours. When production schedules call for overtime, extra precautions should be taken.

Suggestions for reduction of fatigue include:

1. The work assignment should match the physical and mental abilities of the worker and he should be placed selectively at the proper job.

2. The job should be engineered to produce maximum efficiency by attention to such factors as illumination, ventilation, posture, awkward movements, health hazards, noise and general plant orderliness.

3. The supervisor should attempt to reduce any possibility of friction between employees or between himself and the employees. He should make them feel that their job is important to the organization.

4. Speedup of production lines should be undertaken only after full consideration has been given to possible cumulative effects of the increased activity demand.

5. Workweeks in excess of 48 hours or a six-day-a-week schedule should be avoided wherever possible.

6. For monotonous and repetitive work a five-minute rest period in each workhour should be allowed. For less intensive work a 10- or 15-minute rest period in the middle of the first and last halves of each shift should prove beneficial. At these times it helps to make snacks or hot drinks available.

7. Some companies feel that shifts should be rotated every two or three months rather than every week or two.

8. Education programs should be planned to teach rules for good posture, hygiene, nutrition, recreation and relaxation.

Dental Health

Industrial dentistry is concerned with the dental welfare of the employee while in the plant. Dental injuries incurred on the job are definitely the employer's responsibility. Emergency service also is desirable.

How much dental service a company should give a worker is debatable. Relatively few companies employ either full- or part-time dentists.

In communities where dental facilities are available, emergency service for toothaches and injuries on the job, plus diagnostic and educational services, make a well-rounded dental program in industry.

Some companies offer a full mouth x-ray once a year and dental cleansing twice yearly. Along with this service is an intensive educational program. Few companies offer restorative dentistry.

Such a program, many feel, offers no conflict with the dentist in private practice. It has, in fact, made employees increasingly conscious of the need for dental care, and has resulted in increased work for private practitioners.

New stretcher simplifies removal of injured from high locations

Here's another use for the versatile new Haggard's all-purpose stretcher kit. No matter what type of stretcher you now have, you have need for the new Haggard. It does all the things any stretcher can do, plus many more. It is a complete unit ready for instant use anywhere. It is so compact that it fits into a car trunk. Lightweight, only 28½ pounds complete with case, blanket, first aid supplies, and accessories. It's such a totally new concept in utility, versatility and practicality that you should investigate it at once. See how easy it is to store, transport, and put to use. See all the advanced, needed features that make it a combination litter, fracture board, traction splint, and resuscitator. Compact, convenient, complete. Ask your MSco distributor for a demonstration or write Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.

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COMMUNICATION—the modern term for the science of getting ideas across to people—uses a variety of media and techniques. Teaching safe work methods and developing sound attitudes toward safety use many of them.

Oldest of these media is the bulletin board, universally used throughout industry. Employee publications have become a valued ally of the safety program.

Pictures projected on a screen are indispensable in any training program. Slidefilms and motion pictures—color or black and white, silent or talking—can be rented, purchased or borrowed from several agencies.

Awards and prizes for outstanding safety performance stimulate interest and competition.

Signs with stock and special messages give directions and warnings.

SAFETY PROMOTION and TRAINING

11

Training and Maintaining Interest

TRAINING AIDS can help the safety program in several ways: By improving the effectiveness of instruction in safe work practices; by developing sound attitudes toward accident prevention; by supplementing and strengthening on-the-job training.

Safety is so closely associated with efficient operation that much of the instruction serves a double purpose.

The following aids are used extensively in training programs:

1. Employee manuals
2. Motion pictures and slidefilms
3. Bulletin boards and posters
4. Easels and flipcharts
5. Employee publications
6. Instruction cards

Employee Manuals

These booklets tell the employee what the company expects of him and what he can expect of the company. Safe practices, work rules, group insurance, medical service, personal service facilities, and other details of employment are explained. There is a growing tendency to avoid the word "rules" in referring to job practices.

Manuals range from simple mimeographed booklets to elaborate illustrated books. Cartoons give a friendly, informal tone to instruction and make rules seem less forbidding.

Films

Both motion pictures and slidefilms are valuable for training classes and meetings. Types of films include:

1. Strip films projecting individual frames, with the instructor adding the commentary.
2. Sound slidefilms using a similar strip, with disk or tape-recorded commentary.
3. Separate projection slides with either live voice or recordings.
4. Sound and silent movies.

Slidefilms can often be made from photographs taken on the job with amateur equipment.

CARTOONS, professional or home talent, enliven bulletin boards, employee publications and company manuals.

Modern color photography adds realism and attention value to slides and movies, but black and white pictures are useful for some subjects which do not lend themselves to color.

Movies require more expensive equipment and greater skill in their production but short amateur movies have a place in the program.

Most motion pictures, however, will have to be obtained from outside sources. A variety of films can be rented. Many are available through the National Safety Council, which issues an annual list of available movies and slidefilms.

Projection Equipment. Projectors for individual slides, slidefilms and motion pictures with and without sound equipment are available in a wide range of prices. Satisfactory equipment can be obtained at a cost within reach of even the small plant.

An overhead projector is a useful instruction tool. It can be used in a lighted room. An instructor can draw or write with a grease pencil on a piece of acetate or film positive in front of him. He can point to any important phrase or part of a picture. He faces the audience while the image is projected through a lens onto the screen.

Screens are available in a variety of sizes and prices. The size of the meeting room will govern the choice. A beaded screen is more brilliant over a narrower viewing angle and is suitable for general use. A matte screen is better for shorter rooms where the audience is spread out.

FLOW SHEET FOR SAFETY PROMOTION

1. **Organize for safety, employing all available skills to the fullest degree and enlisting all interested parties.**
2. **Train and educate for safety, using well-planned, interesting programs for workmen, supervisors and management.**
3. **Maintain the physical features of the plant and its surroundings in the approved manner to eliminate conditions leading to accidents.**
4. **Keep interest alive with a continuous program of safety incentives. Any of these should be scrapped in favor of new methods the minute it loses its appeal.**

Photography

A camera can provide much useful material for the safety program: slides in black and white and color and enlarged prints for bulletin board and employee publication use.

Still cameras are available in a wide range of prices. These include:

Subminiature—Taking negatives from 8 x 11 to 12 x 17 mm.

35 mm.—Preferred for color slides which fit standard projectors.

Twin lens reflex—Negatives on 120 or 620 film, 2¼ x 2¼ in. make satisfactory enlargements in black and white.

Press camera—The 4 x 5 is the most popular size. Prints are large enough for many uses without enlargement but equipment is rather bulky for amateur use.

One minute cameras—The Polaroid-Land process produces finished prints one minute after the shutter has been snapped. These are useful when a photographic record of the subject is wanted immediately and extra copies are not needed.

Cameras of all types are available with flash synchronization which extends their usefulness. Miniature cameras with fast lenses using fast film can also take many pictures by available light when a flash might be undesirable.

Simple cameras with fixed-focus lenses will often take excellent pictures under favorable conditions but good industrial pictures often require a good camera and a certain amount of skill.

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—Projecting Your Message; L. C. Smith, Jan. 1956.

—Don't Get Into a Rut with Visuals; Robert K. Konikow, June 1956.

—The Camera Sees and Remembers; Robert J. Gell and Earl R. Wallace, June 1956.

—Your Friend the Editor; Irvin K. Weinman, June 1956.

Bulletin Boards

Bulletin boards in prominent locations are an excellent medium for official announcements and news as well as for safety information and reminders in the form of posters, charts, photographs and exhibits of protective equipment.

In companies without employee publications bulletin boards serve some of the functions of a newspaper.

Too often, unimaginative or unsystematic use of boards impairs their effectiveness. A few simple rules will help pep up bulletin boards and increase their usefulness:

—Locate them where they will be seen (cafeterias, recreation rooms, elevator entrances, locker rooms, near time clocks or drinking fountains).

—Change copy frequently. Some companies allow posters and other copy to remain for a week, but a better plan is to change them as often as every two days. Fresh displays always attract more attention.

—Keep copy brief. If possible, use less than 100 words for notices and news items.

—Use large type and plenty of art and color. Humorous cartoons are especially popular.

—Keep as near eye level as possible—about 63 inches from the floor.

—Provide good illumination. Flashing lights attract attention and are sometimes used in nonproducing areas. They may be an objectionable distraction in work places.

—Glass covers protect displays from dirt and defacement and prevent the posting of unauthorized material.

—Don't fill up boards too solidly with printed matter. Liven them up; don't make them too dignified.

Safety posters are visible evidences of an accident prevention program. Unfortunately, some companies have depended on posters to carry the load and neglected such essential activities as guarding and job instruction. If posters are not backed by sincere effort to eliminate hazards, employees will have little respect for the safety program.

The value of posters is emphasized by the efforts of advertisers to acquire billboard space near factory gates. These locations are frequently used for large safety signboards where both employees and the public can get the message. Outdoor boards are made more effective by floodlighting.

A convenient size for a bulletin board is 22 in. wide by 30 in. high.

Boards should be attractively painted and glass covered. Green, traditional safety color, is commonly used but there is no reason why other colors should not be used. One board in a workroom is usually sufficient but in lunch rooms or locker rooms several panels may be used effectively.

Bulletin board displays need not be limited to safety posters. Any subject of interest to employees and management may be used on the boards. In fact, safety posters may have a stronger appeal if displays include other subjects.

One poster alone doesn't do the job. It takes the continuous impact of the program. Different posters will appeal to different persons and to different moods in the same person.

Sometimes a special display may be used to launch a campaign on a theme such as eye protection or safety shoes.

Notices may inform employees about matters of local interest, such as comparative safety records and contests and reports of accidents and near-accidents.

Displays of broken goggles and damaged safety shoes and hard hats are interesting and convinc-

ing when accompanied by stories and pictures of the workers involved. But object lessons can become monotonous and it takes ingenuity to find new ways of presenting new approaches to familiar subjects.

Posters, if carefully handled, can be rotated to three boards. They should be discarded when showing signs of wear. Displays should maintain standards expected of advertisements of the company's products.

Posters bring eye-arresting splashes of color and safety messages to the bulletin board. Often poster displays will catch the new employee's eye on the way to his department. These graphic displays will inform, remind and often amuse, since an occasional light touch has been found effective in getting across serious thoughts.

Jumbo posters, 8½ x 11 ft., are often placed on boards in conspicuous locations where the employee cannot fail to see them when coming to work or leaving the plant. If they can be seen by the public passing the plant, they will also help to make a favorable impression.

Jumbo posters may be obtained from the National Safety Council on a monthly service basis. Billboards may be decorated with original art work, perhaps including the plant's record of accident-free days.

Easels and Flipcharts

Easels and flipcharts are helpful in conducting meetings. Example of this type of material are the National Safety Council's *Safetygraphs*, each dealing with a specific topic designed for use by foremen and others in holding meetings with small groups.

Safetygraphs are collections of drawings, cartoons, charts and other illustrations printed on heavy paper and spiral-bound in a folder that opens to form an easel. With the large illustration facing the audience, the instructor discusses the subject, using his own words or reading the suggested talk on the back of the illustration.

Safety Instruction Cards

Cards 3 x 5 in. covering safe methods of practically every type of industrial operation, as well as seasonal and off-the-job subjects, are issued to employees as part of their job instruction. Often they are placed near the bench or machine to serve as reminders of precautions to be observed on the job.

While the messages on most instruction cards are rather long to serve as posters, some companies make enlarged photostats of the cards and mount them on bulletin boards.

JUMBO posters located in commanding spots carry an impressive message.

Employee Publications

Employee publications furnish an excellent medium for the safety message. These publications range from simple mimeographed bulletins to elaborately printed and illustrated magazines. Illustrated safety stories are regular features in some publications.

Most publications carry news of employee and company activities but some are strictly safety bulletins for employees, supervisors and special groups. * * *

Employee Manuals: Guides, Not Rule Books

USE OF manuals outlining company policies and working conditions has long been a part of employee induction procedure. These booklets may cover general matters dealing with employer-employee relationships, including safety, medical and health service and related topics. Sometimes a smaller booklet containing only safety rules or suggestions is issued.

In most companies, stiff, formal lists of rules have been replaced by friendly, helpful explanations of company policies for employee guidance. Whimsical cartoons can make even orders seem less arbitrary.

Putting this information in print in itself conveys the important message that management is interested in accident prevention. It also is more reliable than verbal instruction.

Books are not a substitute for personal supervision, but it helps the supervisor to have the information in printed form.

Printed rules should be introduced by management endorsement and brief explanations of why rules are necessary, pointing out how the employee gains by safe work practices.

Text should be worded as simply as possible. Simplicity is achieved by being accurate, clear and brief.

Rules should be reviewed at intervals to consider adding new items brought about by changing conditions and altering and deleting those that may no longer be applicable. Sometimes it may be found that new rules are not necessary; rather there may be a need for improvement in supervision or in other media of communication.

Rule books alone cannot be counted on to have much effect on attitudes or to impart much information. However, they are useful aids in a well-planned persistent accident prevention campaign.

It should not be assumed that employees will read the manuals from cover to cover without a little outside stimulation. Manuals can, however, add much to the program if their contents are reviewed briefly when presented and during occasional informal quizzes.

Individual cards covering work practices for specific operations sometimes may be used effectively to supplement general material in the manual. * * *

Safety Slogans!

AND REMINDERS

UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 6 FEET OF HIGH VOLTAGE LINES
546—N

CAUTION WET FLOORS BE CAREFUL
1016—49

STONEHOUSE SIGNS
For Accident Prevention

THINK ACCIDENTS ARE AVOIDABLE FORGET THE ALIBI
1431

DANGER KEEP FROM UNDER CONVEYOR
176—9

NOTICE PERSONAL PROPERTY LEFT ON THESE PREMISES AT OWNERS RISK. WE ARE NOT RESPONSIBLE IN CASE OF FIRE OR THEFT
1300—12

SAFETY FIRST FOR YOUR OWN SAFETY TALK SAFETY
429—G

Most people sometimes forget — and it's a dangerous oversight to forget Safety. "I forgot" is an all too common alibi for an accident.

To help workers *remember*, post Stonehouse Safety Slogans and Reminders signs. Just the few words on any of them help to promote safety.

The tendency to forget should not be overlooked—It's serious. Teach your workers to cultivate the practice of safety by reminding them to *remember* its blessings.

Our complete Catalog—64 pages, in full color—free on request.

Stonehouse
SIGNS, inc. • Stonehouse Bldg., 9th at Larimer • Denver 4, Colo.
MANUFACTURERS
"Signs Since 1863"

ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

Signs for Instruction, Direction and Warning

SIGNS are important for many reasons. At work, they warn of hazards and announce rules and regulations; in public places and on the highway, they give directions and other information. Every day we rely on signs for instruction, direction and warning.

Shape, color, wording and location are characteristics which make signs stand out conspicuously against their surroundings. Recognition of these elements in commanding attention has led to adoption of standards that promote uniformity of design and color.

Some signs, because of their distinctive shape, immediately register their messages. Even illiterates can often grasp the meaning at a glance. Examples are the octagonal stop signs at highway intersections and the cross-buck signs at railroad crossings.

Color. According to American Standards Code Z35, *Specifications for Accident Prevention Signs,* characteristic color for signs should be:

Red—warning of special dangers.

Yellow—caution; possible dangers or unsafe practices.

Green—safety instructions.

MESSAGES on this porcelain enameled signboard can be changed frequently. The 8-in. plastic letters can be changed from the ground with a pair of tongs. (Wagner Sign Service)

Black—directional signs, such as arrows pointing to exits and stairways.

For informational signs any colors except red and yellow may be used.

Commercial signs conforming to specifications of the Code and covering a variety of messages for nearly every industrial situation are available and special signs can be made to order. Enameled metal, the most frequently used material, is resistant to rust and corrosion and is easy to keep clean.

Visibility of warning signs is a requisite. Special illumination may be necessary in poorly lighted areas.

Black on white and black on yellow are the most visible combinations. Other combinations are white on black; yellow on white; blue on white; white on blue.

Yellow is the most conspicuous color in daylight; red can be seen most readily by artificial light.

Red is universally accepted to denote danger or fire apparatus. This should always be considered in choosing color combinations for danger signs. Color's force should not be weakened by indiscriminate use.

Color combinations that contrast with surrounding colors should be used so they will stand out clearly. Use only permanent colors.

Location is an important factor, and a warning sign is ineffective if it cannot be seen easily or if it is too far from, or too close to the point of danger.

Wording of signs should be brief, clear and understandable to persons with limited vocabulary.

Whenever nature of the hazard may not be evident, the sign should if possible specify the danger, such as "Gasoline Storage."

The shorter the wording the better, but many persons resent a brusque order, however impersonal it may be. The best sign will, if it expresses more than a mere stereotyped phrase, like *stop* or *slow,* invite cooperation rather than demand conformity.

Lettering should be as large as possible, consistent with balance and legibility. Block letters generally are preferred for signs.

The weight of line in the body of each letter should be about the same as the space between lines.

Tables of distances at which well-proportioned letters can be read by persons with normal vision under good lighting conditions are given in the American Standards Code. This code also offers detailed specifications on construction of standard signs.

Danger signs should be re-

STANDARDS specify wording, lettering and color scheme for warning and instructional signs.

STOP don't paint that sign...

there are over 2,000 stock wordings in Ready Made SIGNS for SAFETY

in METAL • PLASTICS and the new NEW self-adhering READI-STIK

Join the line of READY MADE clients in industry—at all levels—who have discovered that "time is money"—that READY MADE Signs for Safety have been selling ACCIDENT PREVENTION . . . GREATER EFFICIENCY with even GREATER ECONOMY since 1861 . . .

Don't paint that sign—just fill-in and sign the coupon below, now!

SPECIAL SIGNS TO ORDER at amazingly low, low "in-stock" prices. Send specifications for a fast quotation.

Ready Made SIGNS for SAFETY

READY MADE SIGN CO., INC.
signs for industry since 1861
115 WORTH STREET - NEW YORK 13, N. Y.

READY MADE SIGN CO., INC.
DEPT. NSN-73, 115 Worth Street, New York 13, N. Y.

Yes! Send us:

- ☐ Current Ready Made Catalog
- ☐ Place our name on your list for your new Ready Made Catalog*

Please send further information on:

- ☐ Safety & Accident Prevention
- ☐ Traffic
- ☐ Municipalities
- ☐ Special signs to order (copy enclosed for quotation).
- ☐ Trucks
- ☐ In-plant
- ☐ enroute
- ☐ Other

Name _____ Title _____

Address _____

City _____ Zone _____ State _____

A noted research man finds a fact that can't be put down in black and white

Wausau Story

by A. C. NIELSEN, JR.
Executive Vice President,
A. C. Nielsen Company

Curbstone artists from Wausau's Junior High School and Wausau visitor Mr. Nielsen get a lesson in art and observation from instructor Don Crawford.

"Every time I'm near a construction job, I have to stop and see what's going on. They were repairing a street when I was in Wausau so, of course, I joined the crowd along the curb.

"Then I discovered I was right in the middle of an art class from the Wausau Junior High School. I watched those boys as they'd take a good look at the busy scene in front of them and then sketch what they'd seen. 'This makes sense,' I said to myself. 'These youngsters are learning how to observe and record their observation.'

"I'm a great believer in that. Naturally, I suppose, because I'm associated with a company whose business is observing. As a market research organization, we watch and record the progress branded merchandise makes in stores.

"An interesting thought struck me as I observed Wausau and its people. Here is a city that has become a famous brand name. Not a name on a package of merchandise but a name that identifies a good way of life. An attitude and a manner of living as closely distinguishable as any trade-mark.

"That's the kind of information you can't record in a statistical table and show on a trend chart. But I could sense it and knew it for something mighty worthwhile as I visited Wausau, Wisconsin."

"I enjoyed visiting the home of Mr. and Mrs. Carl Hansen in Wausau. They have one of our Audimeters on their TV set. It automatically records their pattern of listening. By collecting data we can tell advertisers how their programs rate. Mrs. Hansen was canning pickle relish from her home-grown ingredients. She gave me a sample. It sure rated tops to my taste."

We thank Mr. Nielsen for his comments on our Wausau "brand" of life. We try to make it our brand of business, too. Our business is insurance. We write all lines of fire and casualty and we are one of the largest in the field of workmen's compensation. Discover our brand of doing business. See our representative (consult your telephone directory) or write us in Wausau, Wisconsin.

Employers Mutuals *of* Wausau

"Good people to do business with"

stricted to such immediate and serious hazards as high-voltage equipment, toxic and corrosive chemicals, collision hazards, explosives. Employees should be warned of the importance of such signs.

Caution signs warn employees of potential hazards, such as improper use of elevators, cluttered aisles and sparks from grinding wheels; or against unsafe practices such as oiling machinery in motion, smoking in forbidden areas and operating machines without guards.

Workers should be trained to respond to caution signs as an indication of potential danger requiring care and alertness. The difference between the **danger** and **caution** signs is one of degree.

Other general types include safety instruction signs, which designate certain actions or practices; directional signs, and information signs.

Reflectorized signs are useful day or night. In darkness they stand out brightly under the beams of a flashlight. They are available in standard designs for warning, direction and locating emergency equipment.

Maintenance. Periodic inspection and inventory of signs should be part of the safety program.

THE AEC symbol, purple on a yellow background, is becoming recognized as the warning sign for radioactive hazards. The low-cost storage vault was built for Cobalt 60 used in gamma raying thick weldments at Eddystone Division of Baldwin-Lima-Hamilton Corp.

REFLECTORIZED signs are available in standard designs. The beam of a flashlight picks up signs indicating hazards or emergency equipment. Such signs may avert panic and save lives in case of power failure.

Signs should receive the same cleaning and maintenance that is given to other equipment. Dirty, disfigured signs are not convincing.

Signs no longer needed should be removed. Where hazards have changed, signs more appropriate to present conditions should be substituted.

Warning tags come in a variety of stock subjects. They are attached to equipment in emergencies to warn others that men are working on machines, that a valve on a pipe line has been shut because of a leak, etc. They are also used on unsafe equipment which is to be removed from service.

Decals are miniature signs which can be attached permanently to machines, walls or other places where a message of warning, caution or brief instruction is needed. They conform to standard specifications of design and color.

Signboards with changeable letters are available in small sizes suitable for departmental use and larger types which may be erected in conspicuous places near the plant entrance where they can be seen by both employees and the public.

These boards may be used for brief safety messages and for recording the plant's record of no-accident days. * * *

Barricade
DANGER
AREAS
with
Brenton
Barricade Tape

The high visibility of this brilliant yellow and black Saran plastic tape commands attention—gives maximum protection as a barricade around energized or contaminated areas, or wherever personnel may be exposed to danger. Red stripe on white tape also stocked.

Non-conductive, sun-fast, moisture-proof, easily cleaned, won't stretch. Instantly recognized as a barrier to hazardous areas.

Available from stock in ⅝" widths in approximate 50-yard lengths on Reusable reel. Other widths and color combinations available on special-order where quantities justify.

Write today for your free sample and prices

Brenton
Equipment Company
374 Brannan Street
San Francisco 7, California

How to Plan Effective Meetings

FOR UTMOST effect in motivating and supplementing instruction, audio-visual aids should be chosen to fit in with the method of instruction to be used, group to be instructed and objectives to be achieved.

Audio-visual aids should serve to:

—Formulate correct ideas.
—Create interest.
—Intensify impressions.
—Broaden experience.
—Save learning time.

No matter how good the aid, its effectiveness will be determined largely by the way it is used. Audio-visual aids have the advantage of being easily understood even by poor readers.

It should be remembered that audio-visual aids are not a complete program in themselves. Here are some suggestions for their use:

—The user must know his subject and be thoroughly familiar with the aids.
—Material must be introduced properly. Tell the audience what to expect and its significance.
—Avoid distractions, such as noise, improper focus.
—Don't use too many devices.
—Plan the sequence.
—Try for exact timing and smooth handling.
—Be sure material is pertinent and clearly displayed.

Audio-visual aids may be rented or purchased. Some may be made to order by an outside agency or within the plant. Homemade aids range in price from a few to several thousand dollars.

Following are some of the aids used:

1. Charts—from 8½ x 11 in. to 30 x 40 in.
2. Models, mock-ups, demonstrations.
3. Flannel boards.
4. Movies.
5. Slidefilms.
6. Recorders—wire and tape, sound-scriber.

How much did they learn? After a meeting in which any of the above aids was used, see how much the group has learned. This may be done by oral questions, written tests or performance tests. * * *

Conversation Piece

One of our red-blooded American type citizens was arrested the other day as he pulled up to a stop sign. It seems he had been driving along the road—face fully lathered—shaving. As the police officer wrote up a ticket he complained, "I didn't know it was against the law to shave while driving."

That was a real sharp repartee, if I ever heard one. Real character bait. Yet, his remark was about "par for the course" as far as attitudes toward safety go.

Now I'm not saying the world is all clogged up with characters, but folks seem to have a special niche in their hearts for the person or thing which is out of the ordinary, these days. You can't even redecorate the house unless the "decor" is set around a "conversation piece." And, I mean, some of the conversation pieces you see are way—out—there!

Folks invite the "unique" to their parties just to lend originality to the carryings-on. Good musicians can't make a buck since to be a hit you have to be off-beat, off-tune, or have a gimmick.

We seem to be searching for something—or anything—to break the monotony of a dull, routine life. But what many of us call dull and routine would have been riotous living in Grandma's day. Even Grandma's nightcap used to be something that went on her head.

If we would only use safety as a "conversation piece" occasionally, we could increase the life expectancy of many of us whose only claim to fame will be a violent death item in the obituary column.

We need to turn off the TV set—after a favorite program—and while sopping up a bit of our favorite beverage muse about what we can do to insure our being around next week at the same time.

Don't you become a "conversation piece," by getting mangled before your time.

—Robert D. Gidel

NSC Section Announces Speakers Bureau

A Speakers bureau to supply experts with varied experience in hygiene, industrial and safety problems has been established by the Power Press and Forging section of the National Safety Council.

Announcement of organization of the bureau, to be administered from the Safety Council headquarters in Chicago, was made by George D. Reed, Lansing Employers Underwriters, Lansing, Mich., section chairman.

Available for speaking engagements are:

D. W. Stitt, assistant general manager, industrial relations, Continental Can Co., Inc., New York City.

Frank W. Marcaccio, chief, division of industrial inspection, Department of Labor, Providence, member of the Rhode Island Atomic Energy Commission and responsible for safety program planning in the state's industrial plants as well as new personnel training programs.

Thomas H. Bullard, safety engineer, Red Lion plant, The Budd Company, Philadelphia, who administers the plant's safety program as well as those for community use and is an expert on punch press operations.

Herschel L. Smith, safety engineer, General Electric Company, Fort Wayne, Ind., who started in safety work in 1925 making safety cartoons and since 1952 has occupied his present position as well as supervised suggestion activities. He has designed many guards and other safety measures, particularly for use on power presses.

Carl J. Peterson, staff safety engineer, Chrysler Corporation, Detroit, Mich. *(—Turn page)*

"Telephones are ubiquitous?"

"Yes, telephones are ubiquitous"

Robert Day, the well-known cartoonist who drew this picture, was a little afraid there might be some people who wouldn't know what we meant by ubiquitous. "It's a pretty big word," he said.

"Don't worry," we told him. "We'll just put in a little reminder that the dictionary says ubiquitous means 'existing or being everywhere at the same time.'"

There's surely no better way to describe telephones! They're not only in millions of homes and offices but just about everywhere you go. In stores and at gas stations! At airports, bus depots and railroad stations! Out-of-doors!

Throughout the country, there are hundreds of thousands of these public telephones for your convenience.

So the next time something comes up when you're away from home or the office, or there's some news you'd like to share with someone, just step up to one of those nearby telephones and call.

You can save yourself a lot of running around, be a number of places in a few minutes, and get things settled while they are fresh in your mind.

Working together to bring people together... **Bell Telephone System**

E. Clark Woodward, director of safety and security, A. O. Smith Corp., Milwaukee, who is widely known for his talks on industrial and highway safety into which he injects a little humor. He has been in industrial safety 20 years. Mr. Woodward is chairman of the Wisconsin Governor's Committee for Highway Safety.

George E. Deming, Jr., personnel director, Heintz Manufacturing Co., Philadelphia, long active in safety efforts in Greater Philadelphia area, particularly fire hazards.

Willard A. Dudley, safety engineer, department of fire prevention and safety, Eastman Kodak Company, Kodak Park Works, Rochester, N.Y., whose specialty is punch press guarding and a foreman's responsibility in accident prevention, with a background that includes fire and safety work with the U.S. Army.

Frank E. Bird, Jr., supervisor of safety and plant protection, Lukens Steel Co., Coatesville, Pa., a specialist in human relations with a U.S.N. background.

Charles D. Brainerd, safety engineer, Oldsmobile division, General Motors, Lansing, Mich., an expert on power press maintenance and safety in forge plants. He is chairman of GMC's forge divisions safety committee.

Arthur R. Graham, supervising safety engineer, Chicago district, Bituminous Casualty Corp., Chicago, who talks about "Guarding of Machines," "Small Plant Safety Problems," "Woodworking Hazards" or "Handling of Materials" and has been a member of all the President's Safety Conferences.

Frank Hausman, punch press specialist, Employers Mutual Liability Insurance Company of Wisconsin, River Forest, Ill., who has spent the last 10 years in punch press accident prevention work.

George M. Johnson, safety director, Diebold, Inc., Canton, Ohio, former Spokane, Wash., policeman, and U.S. Secret Service agent, who has done much safety and security work with motor fleet operators since going into safety work, who usually lets the groups to whom he is speaking select the subjects for his discussion.

T. A. Kraklow, safety director, Deere & Co., Moline, Ill., and former supervisor and general foreman and therefore, is familiar with shop problems.

E. D. Salle, supervisor, safety and industrial hygiene, American Can Company, New York, who has given many talks on general safety philosophy and industrial hygiene.

The Speakers Bureau has several other speakers available, whose biographies are available at the National Safety Council office.

A minister was asking one of his flock why he had not attended church lately.

"Well you see, sir," said the man, "I'm troubled with a bunion on my foot."

"Strange," said the parson, "that a bunion should impede the pilgrim's progress."

One way to save face is to keep the lower end of it closed.

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STREET.....

CITY & STATE.....

*REG.

WHAT'S NEW IN NATIONAL SAFETY COUNCIL SERVICES *

A Waggin' Tale

The old saying has it that a dog is man's best friend.

Try to tell that to the newsboy who has just been chased half a

block for innocently tossing a paper on a porch next to the canine lord and master of the house. Or see if you can convince the meter reader, who's just lost the seat of his pants to a "friendly" mongrel. Or ask the mailman who's been nipped and snapped at by half the pooches in the neighborhood.

Anyone who finds it necessary in his work to push doorbells and brave the wrath of the family pet will appreciate receiving a copy of the Council's new folder, *A Waggin' Tale*.

Here are some tried and true rules for getting along with pups of all sizes. Amusing cartoons illustrate the basic techniques of how to win friends and influence dogs.

A Waggin' Tale is an economical handout. Reading it will provide mailmen, meter readers and others with the basic techniques for getting along with dogs. Some utility companies are having copies of *A Waggin' Tale* imprinted and sent to their customers and others as a public service. It's a friendly way of telling folks that dogs, no matter how gentle they may appear to their owners, can be a problem to those whose business takes them from house to house.

Operation Safety

Did 1956 set an all-time record for death on the highway?

The figure is estimated at 40,000, which would seem to be a new record. But with as little as one per cent variation possible when the official figures are recorded, the final tally could go either way.

The previous all-time high is 39,969 fatalities set in 1941. A variation within one per cent of 40,000 would place the figure between 39,600 and 40,400. Even a reduction of one-tenth of one per cent from 40,000 would keep 1956 from setting a new record.

Predictions in early fall ran as high as 42,000. Toward year-end, 41,000 seemed more realistic. The best educated guessers were convinced a new record was in the making. Fall saw the tide turn. October showed a remarkable drop from last year's toll. December held the line despite the 706 Christmas holiday traffic deaths. The final three months left the year's total uncertain.

The nation-wide "Back the Attack on Traffic Accidents" program was opening up just about the time traffic deaths began to drop off. While it formally began in December, official activity began to be stepped up as early as October in many areas.

How successful will "Back the Attack" be? How much will officials step up the attack? How much police and court enforcement, engineering and legislation will be improved? How much more solid will citizen support of official programs be?

The answer to these questions will not be known until the end of 1957. Will "Back the Attack" help keep 1957 from again threatening or even breaking the record? The value of a concentrated, national "attack" on highway deaths and injuries should leave no doubt in anyone's mind after the 1957 picture is known if all interests step into "Back the Attack" with increased vigor and determination.

"Back the Attack" can serve to unite more forces behind the fuller adoption of the action program for traffic safety than any campaign has ever done. The moral responsibility emphasis in this spring's Operation Safety program answers a long-felt need for putting the responsibility squarely up to the individual driver. Clergymen and others who have delved into the complex problem of driver behavior have stressed the moral aspect of driving for years.

The monthly theme for April is "Know and Obey Traffic Laws." Materials include the regular sample newspaper and radio publicity material, program aids, a speech outline and descriptive literature on posters, leaflets and film trailers.

The featured "Back the Attack" poster of the month makes this appeal to drivers—"Make Driving Pleasant, Follow the Rules." It is available in the "C" size (25 x 38 in.) and the "A" size (8½ x 11½ in.). A leaflet on moral responsibility in the "Back the Attack" series is sampled in the kit as well as an additional leaflet, "Alert Today—Alive Tomorrow."

For further information on Operation Safety programs, write to National Safety Council, 425 N. Michigan Ave., Chicago 11.

* Look to this page each month for latest news about NSC services. Address request for additional information, samples or prices to the Membership Department.

For a More Successful Poster Program

POSTER program aids miniatured on this and the following pages are NEW — shown here for the first time. Those illustrated in one color are actually printed in two or more colors.

Also, be sure to refer to the new 1957 Directory of Occupational Posters which contains an excellent selection of 756 posters on a great variety of subjects.

Copies of the new Directory are available at 60 cents each.

JUMBO POSTER FOR MAY 1957

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

SAFETY BANNER FOR MAY, 1957

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-color design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.

1015-A 8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1957 Poster Directory.

Electrotypes of poster miniatures on this page are not available, nor can payroll inserts be supplied.

Posters below are printed in two or more colors

(Available only in sizes indicated)

0778-A 8½x11½

0710-A 8½x11½

0979-A 8½x11½

0790-A 8½x11½

0973-B 17x23

0991-B 17x23

0895-B 17x23

1014-A 8½x11½

0881-A 8½x11½

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

Posters below are printed in two or more colors

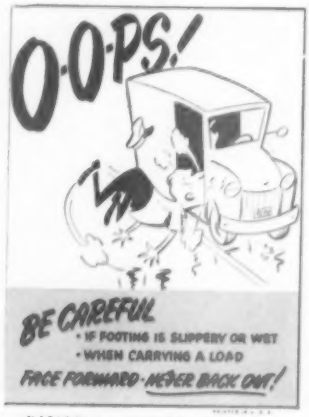
(Available only in sizes indicated)

0884-A 8½x11½

0841-B 17x23

0997-A 8½x11½

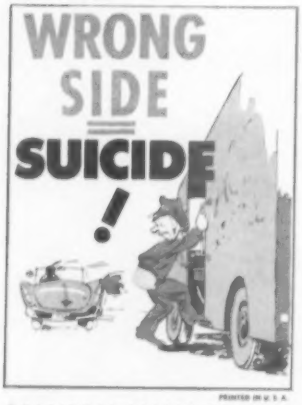
0904-A 8½x11½



0945-A 8½x11½

T-1010-C 25x38
T-1011-A 8½x11½

V-1008-A 8½x11½



V-1009-A 8½x11½

V-1006-A 8½x11½

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

CONSULTATION CORNER

By George MacDonald, *Industrial Department, NSC*

Got a problem in accident prevention or occupational hygiene? Questions are answered by mail, a few of general interest being selected for publication here

Soldering Gas Tanks

Question. We have a problem involving soldering gasoline truck fuel tanks.

One of our members reports that it is impractical to follow the recognized procedure of draining gasoline from the tanks and purging them before modifying the filler neck, which involves soldering with an electric soldering iron. What other precautions do you recommend?

Answer. The hazard involves possible ignition of gasoline vapors that may be present, since the work now is being done without purging the tanks or removing gasoline from them. Assuming that other ignition sources were removed from the work area, the soldering iron itself still might constitute a source of ignition.

Its soldering surface temperature is likely to be in excess of the ignition temperature of gasoline vapor. Of course, there is always a possibility of a short circuit in the soldering iron. That might cause a spark, either because of a short in wiring of the iron or from insulation failure within the iron, which could energize the iron's soldering surface and result in a spark when when the iron is brought into contact with the tank.

As to whether carbon dioxide or some other inert gas might be used in the tank during this operation to eliminate any hazardous gasoline vapor condition, we would hesitate to recommend this. Further information on the use of carbon dioxide for inerting, however, can be found in National Fire Protection Association Pamphlet No. 327-T, a tentative standard for *Procedures for Cleaning or Safeguarding Small Tanks and Containers.*

The NFPA *Hand Book of Fire Protection* contains a table showing reduction of the oxygen content of air necessary to prevent fires and explosions. The table varies with different materials being handled and with the kind of inert gas used. Normal oxygen content of the air is about 21 per cent, and the table shows that the maximum permissible percentage of oxygen in air when the inert gas is carbon dioxide and the flammable material is gasoline vapor is 14.4 per cent of oxygen.

Note, however, that the NFPA pamphlet states in paragraph 324:

"The oxygen content shall be maintained at substantially zero during the entire period when work is in progress. Attempting such work without proper knowledge or equipment can be hazardous due to the false sense of security engendered."

Solvents for the Printing Industry

Question. Can you give us (a printing firm) information on (trade name) special type wash?

Answer. From the information supplied by the manufacturer, it is quite obvious that the material is a low-flash petroleum naphtha. It is unlikely that the material contains any dangerously toxic solvent so that phase of the problem can be ignored or handled along with the fire considerations.

Inasmuch as this material is a low-flash solvent, it would be well if the following precautions were followed:

1. Bulk storage facilities for this solvent should be located so that in event of fire no other part of the plant is endangered.

2. Approved safety containers

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MANUFACTURERS OF BULLETIN BOARDS FOR EVERY NEED

should be used. They should have self-closing spouts to prevent liquid from becoming ignited by accident, or vapors from entering the atmosphere. Under no circumstances should open containers be used.

3. Drums of solvents should not be stored in work areas. Only small amounts of solvents should be taken to a work area, and then only in approved safety cans.

4. Spilling flammable liquids should be avoided. Vapors may flow long distances along the floor or ground to be ignited and flash back.

5. A "No Smoking" rule should be strictly enforced in areas using flammable solvents.

6. Self-closing containers should be provided for disposal of rags and materials that have been used with solvents for cleaning.

7. Contaminated solvents which are not reclaimed or recovered should never be poured down a drain or a sewer. They should be removed from the area in a closed container and disposed of in an acceptable manner.

8. Solvent containers should be identified conspicuously by proper coloring and lettering.

9. Measures should be taken to reduce static electricity, such as grounding drums and containers holding solvents and establishing contact when transferring from one container to another.

10. Extinguishing agents that have smothering or blanketing action should be available. If CO_2 extinguishers are selected, they should be checked with the manufacturer to eliminate the possibility of static formation.

The National Safety Council's publication, *Safety Manual for The Graphic Arts Industry*, covers handling of flammable solvents in the printing industry in an acceptable manner. In addition to this publication, the National Board of Fire Underwriters, as well as the NFPA, has published bulletins on fire hazards in printing plants.

NEW! Uniform Pipe Identification System

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Free Planning Kit

- Shows you *how and where* to mark utility, process, and supply lines.
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- Tells you how to *write specifications.*
- Simplified check list *figures your marking needs.*
- You can *compare actual costs* for painting and stenciling vs. the Brady System.
- *Planning Schedule* helps install marking system fast at lowest cost.
- You get *working samples* for testing.

If marking pipes is your responsibility, write for this valuable Planning Kit on your letterhead today.

42

W. H. Brady Co., 721 W. Glendale Ave., Milwaukee 12, Wis.

Weathertite BAKED ENAMEL SIGNS STANDARD REGULATION SIGNS OF ALL KINDS FOR SAFETY AND EFFICIENCY

Write for Catalog

PRAIRIE STATE PRODUCTS CO. 3822 LAWRENCE AVE. CHICAGO 25, ILL.
EST. 1930

Exhaust Ventilation For Pickling Tank

Question. We have several problems in connection with exhaust ventilation for a pickling tank. These are the specifications:

Solution—30 per cent and 50 per cent concentration nitric acid and hydrofluoric acid, respectively.

Tank surface area—about 10 sq. ft.

Gases—nitrogen oxides and hydrogen fluoride.

Estimated exhaust—1,000 to 1,500 cfm. of gases and air.

Absorption tower—anticipate use to avoid atmospheric contamination.

We need the following information:

—What type and size absorption tower would be most economical?

—What material should be used to construct the tower?

—What material should be used for the cabinet (exhaust hood), ducting and exhaust stack?

—Method of exhausting gases—fan or air ejector?

—Is it necessary to neutralize the acids formed in the absorption tower prior to dumping into sewer? If so, what method should be used?

Answer. In your inquiry about proper exhaust ventilation for a

pickling tank using nitric and hydrofluoric acids, you did not indicate the type exhaust which you intend to use, or the shape factor of your tanks, both of which are important for estimating the air volume.

If you are using a lateral exhaust, generally the most appropriate for pickling since it gives ready access over the top of the tank, and rectangular tanks of length-to-width ratio of about 2, your estimate of 150 cfm. per sq. ft. of tank area is a good minimum figure. The design criterion is that you should have 100 linear fpm. minimum at the edge of the tank, from the exhaust hood when the tank is not exposed to severe drafts. If there are any severe drafts this minimum must be increased or baffles installed around the tank.

The combination of gases which you are going to exhaust is going to be extremely corrosive. It would be most satisfactory to build your hood and piping of an asbestos-cement composition. The absorption tower would most appropriately be made of ceramic material of some sort. It will be attacked by the hydrofluoric acid, but with a good flow of absorbing water the rate of attack will not be serious.

For this type of operation a counter current spray is generally most desirable, since it minimizes the pressure loss. A tower packed with berl saddles is a more efficient absorber, but if you go to this type, you will probably require a high pressure blower which runs into considerable power. Your own engineers will have to decide which type you prefer. The one requirement you should set as a definite criterion is that the blower should be on the downstream side of the absorber. The only type blower which would stand up at all in the exhaust gases would be a Nash-water-sealed, with a continuous flow in the sealing water circuit.

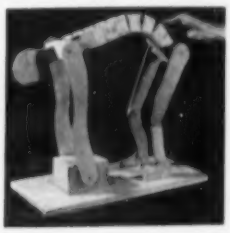
It is not possible to say whether you have to neutralize the acids formed. They are not primarily toxic to either animal or plant forms or aquatic life, but you should not release enough to appreciably change the Ph of the receiving stream or of the sewage disposal tanks.

A Reply to the Answer

Please accept my sincere thanks for your letter. The information regarding the proper exhaust ventilation for our proposed pickling tank has enabled me to influence the thinking of our ground engineering staff. I feel sure now that we will not only have an efficient intallation, but a *safe* installation.

PREVENT BACK INJURY!
***SHOW* THEM HOW**
TO LIFT THE *RIGHT* WAY

"LIFTY"



Lifting heavy objects the wrong way can cause hernias and severe back injuries. "Lifty," the animated training tool that really puts a point across, dramatically shows your workers just how such injuries are caused by incorrect lifting . . . and shows them how to lift the right way, with the legs instead of the back.

24" high, sturdy wooden construction. 2 models available; clear lacquer or in 3 colors.

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Four Groups to Join in Atomic Energy Congress

PEACETIME USES of atomic energy will be the topic of the 1957 Nuclear Congress, scheduled for March 11-15 at Philadelphia's Convention Hall, under the coordination of Engineers Joint Council. The session will bring together leaders in science, engineering, industry, government, education, agriculture and other fields.

Included in the Congress are four major elements, including the Second Nuclear Engineering and Science Congress, coordinated by EJC on behalf of 20 engineering and scientific societies.

The National Industrial Conference Board will hold its Fifth Conference on Atomic Energy in Industry, featuring 12 round-table discussions, a dinner on Thursday, March 14, and a luncheon meeting on March 15th.

The International Atomic Exposition, sponsored by the American Institute of Chemical Engineers in cooperation with four other engineering societies, will display industry's latest items in the atomic field.

The Fifth Hot Laboratories and Equipment Conference, sponsored by the Hot Laboratories Committee of the Oak Ridge National Laboratory, Oak Ridge, Tennessee, will take place on March 14 and 15 and deal with the operation and development of equipment for laboratories for atomic energy.

Presented at the Nuclear Engineering and Science Congress will be 130 technical papers dealing with various phases of nuclear operations from mining to the disposal of radioactive waste. Emphasis will be on new developments of potential value to civilian industry, especially in the fields of metallurgy, chemical processing, mechanical and power application.

Topics which will be covered by the "Fifth Atomic Energy In Industry Conference" are fusion; recent developments in radiation chemistry and radio-isotopes applications; foreign and domestic markets for atomic energy products; nuclear propulsion; waste disposal; health and safety problems; the economics of new reactor types; the latest developments in atomic energy legislation; site selection problems for nuclear facilities and problems in local and state atomic energy regulations.

The 1957 Congress, already supported by 20 major United States engineering, scientific and management groups, also expects representatives from other nations to participate.

Fire and Gas Deaths Highest in Winter

Accidental loss of life from fires and burns by other means is nearly 3 times as high, and that from poisonous gas 5 times as high, in winter as in summer, according to statisticians of the Metropolitan Life Insurance Company.

Both classes of fatalities are associated largely with increased use of heating facilities.

Many fatalities, the statisticians report, result from improperly installed or defective heaters. A number of gas deaths are caused by running an automobile motor in a closed garage or while a car is parked.

Fatal falls also are at a maximum in winter, though the rise is relatively moderate. The death toll for February, peak month, is only about 8 per cent higher than the annual average.

How Much Should A Person Lift?

Physical differences among individuals make it impractical to set arbitrary lifting limits for workers. Height and weight do not always indicate physical strength.

State codes on this subject differ widely. Each employer should be familiar with state regulations.

The following weights (in compact form) are not official limits but are generally accepted for continuous or repetitive operations:

Men: 50 lbs.

Women: 25 lbs.

Where lifting is done continuously, even though weights may not be excessive, mechanical equipment often reduces fatigue and speeds up work.

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Berry, C. R., Sales Co., 275 Giralda Ave., Coral Ganles, Fla.
Auto-Elec. of Georgia Inc., 115 Piedmont Ave. N.E., Atlanta, Ga.
H & M Auto Parts, 2115 So. Michigan Ave., Chicago, Ill.
Rankin Mfg. Co., First & Iowa Sts., Cedar Falls, Ia.
Borgenson Sales, 2631 Meadowbrook Dr., Cedar Rapids, Ia.
Garnett Auto Supply, Inc., 1111 E. Kellogg St., Wichita, Kan.
A-1 Safety Supply Co., Rt. No. 3, Box 545, Anchorage, Ky.
New England Speed Equip. Co., 169 Brighton Ave., Boston, Mass.
Hollywood Automotive Accessories, 10050 Plymouth Rd., Detroit, Mich.
Wessel Radiator Service, 119 E. 4th St., Fairmont, Minn.
Millard Auto Supply, 1930 McGee St., Kansas City, Mo.
Lincoln Oil Co., 240 P. St—Box 1702, Lincoln, Neb.
Kar Motor Rebuilders, 1159 Jefferson St., Buffalo, N.Y.
Forshay Brothers, Inc., 245 W. 55th St., New York, N.Y.
Best Auto Accessories, 11227 Superior Ave., Cleveland, O.
Main Auto Parts & Glass Co., 603 So. Broadway, Dayton, O.
Randel Accessory Supply, 1000 N.W. 10th St., Oklahoma City, Okla.
Leland Equipment Co., P.O. Box 950, Tulsa, Okla.
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BRANCH OFFICES:
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Baker-Roos, Inc.
602 West McCarty St., Indianapolis, Ind.

Ballymore Company
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Banite Co.
Banite Bldg., Buffalo 4, N. Y.

Bashlin, W. M., Co. **172**
Bashlin Bldg., Grove City 3, Pa.
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Southern Electrical Equip. Distr., 1375 Lee St., S.W., Atlanta, Ga.
A & S Power Equipment, Inc., 21 St. James Ave., Boston, Mass.
Dolan-Feldhaus Co., 5 W. Lake St., Minneapolis, Minn.
Copperweld Steel International Co., 117 Liberty St., New York, N.Y. (Exporter)
B & M Supply Co., P.O. Box 426, Tiffin, Ohio
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Blood Orchards, 6346 S. Broadway, Wichita, Kans.
Ingersoll Corp., 210 N. Airport Dr., Shreveport, La.
Tate Engr. & Supply Co., 516 S. Eutaw St., Baltimore, Md.
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DaLee, Wm. A., Inc., 9190 Roselawn Ave., Detroit, Mich.
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Fire & Safety, Inc., 1968 S. Broadway, Rochester, Minn.
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Chemical Pump & Equip., 75 West St., New York, N.Y.
Chemical Pump & Equip., 3537 Lee Road, Cleveland, Ohio
White Ind. Sales & Equip., 140 W. 6th St., Cincinnati, Ohio
Carson, Mach. & Supply, 202 S.E. 29th St., Oklahoma City, Okla.
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Briggs Weaver Mach., 5000 Hines Blvd., Dallas, Tex.
Dannenbaum, M. N., Co., P.O. Box 14496, Houston, Tex.
Fire Control & Equip., 105 S. 12th St., Richmond, Va.
Cross Pump & Equip., Box 889, Charleston, W. Va.
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Consolidated Engines, Ltd., 5645 Pare St., Montreal, Quebec, Can.

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1602 Locust St., St. Louis, Mo.
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Zink Safety Equipment Co., 700 W. 12th St., Kansas City, Mo.
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Cook, Ellis, Co., 5227 N.E. Sandy Blvd., Portland, Ore.
Clarke, Paul V., 280 Orchard Dr., Mt. Lebanon, Pittsburgh, Pa.
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Douglas, Geo. R., 1225 Columbian Mutual Tower, Memphis, Tenn.
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Herlin Engineering Co., 600 W. Paisano Dr., El Paso, Tex.
Ray Engineering Co., 4411 Belmont Ave., Dallas, Tex.
Price, Thomas E., 206 Hyta St., Houston, Tex.
Parry, Geo. A., & Sons, 780 Kensington Ave., Salt Lake City, Utah
Williams, Rex W. & Sons, P.O. Box 2016, Salt Lake City, Utah
Turner, Frank, & Co., 7105 Hermitage Rd., Richmond, Va.
Burtch, Bryan W., Co., 2915 First Ave. S., Seattle, Wash.
Nelson Mechanical Eqpt. Co., 124 E. Augusta Ave., Spokane, Wash.
Fireproof Products Co., P.O. Box 2311, Charleston, W. Va.
Petley, J. R., Co., 759 N. Milwaukee St., Milwaukee, Wis.
Aristocrat Mfg. Co., Ltd., 77 Pelham Ave., Toronto, Ont., Can.
Compania Marx, Postal Apartado 1494, Mexico, D.F.

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General Equip. Corp., 261 Franklin St., Boston, Mass.
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Continental Safety Equip., Inc., 1551 Selby Ave., St. Paul, Minn.
Safety, Inc., 17½ E. 31st St., Kansas City, Mo.
Safety, Inc., 2608 Olive St., St. Louis, Mo.
Big Horn Supply, Inc., 2120 Third Ave., No., Billings, Mont.
Safeguard Ind. Equip. Co., 271 Verona Ave., Newark, N.J.
Approved Fire Protection Co., P.O. Box 507, North Plainfield, N.J.
American AllSafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.
American AllSafe Co., Inc., 2704 Erie Blvd., P.O. Box 1116, Syracuse, N.Y.
Acme Safety Products Co., 387 Storer Ave., Akron, Ohio
Orr Safety Equip. Co., 2853 Colerain Ave., Cincinnati, Ohio
Safety First Supply Co., 4251 W. 35th St., Cleveland, Ohio
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Sanderson Safety Supply Co., 816 S.E. Hawthorne Blvd., Portland, Ore.
Industrial Products Co., 2820 N. 4th St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Clement Safety Equip., Inc., 720 S. 3rd St., Memphis, Tenn.
Guardian Safety Equip. Co., 1915 Westheimer, Houston, Texas

Brannock Device Co. 172
509 E. Fayette St., Syracuse, N. Y.

Breck, John H., Inc. 67
115 Dwight St., Springfield 3, Mass.

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1500 S. Western Ave., Chicago, Ill.
5 E. 57th St., New York, N.Y.

Brenton Equipment Co. 275
374 Brannam St., San Francisco, Calif.

Brett-Guard Co. 226
105 S. Dean St., Englewood, N. J.

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Brenton Equip. Co., 489 Bryant St., San Francisco, Calif.
Guardian Safety Equip. Co., 427½ Moreland Ave., N.E., Atlanta, Ga.
Universal Safety Equip. Co., 5115 W. Diversey, Chicago, Ill.
Standard Industrial Products Co., 920 N. Garfield Ave., Peoria, Ill.
Williams & Co., Inc., 1109 S. Preston St., Louisville, Ky.
Davis Emergency Equip. Co. of N.E., 130 W. Emerson St., Melrose, Mass.
Mathias-Hart Co., 152 Market St., Lowell, Mass.
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Halperin, A. E., Inc., 2208 E. Fayette St., Syracuse, N.Y.
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Acme Safety Products Co., 387-89 Storer Ave., Akron, Ohio
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Acme Safety Products Co., 1823 Vermont, Toledo, Ohio
Safety First Supply Co., 858 W. Delaware Ave., Toledo, Ohio
Guardian Safety Equipment Co., 1742 S. Main St., Tulsa, Okla.
Haseltine, J. E., & Co., Second Ave. & Ash Sts., Portland, Ore.
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Genter, C. D., Company, 2109 Broad St., Chattanooga, Tenn.
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Clement Safety Equipment, Inc., P.O. Box 2586, Memphis, Tenn.
Hays Supply Company, 287 S. Front St., P.O. Box 2585, Memphis, Tenn.
Radcliff Supply Co., 115 S. Polk St., P.O. Box 1987, Amarillo, Tex.
Sabine-Neches Safety Equipment Co., 3331 Port Arthur Road, Beaumont, Tex.
Engineering Supply Co., 6000 Denton Dr., Dallas, Tex.
McDonald, B. F., Company, 3754 Greenbriar Dr., Houston, Tex.
Thompsons' Specialties, P.O. Box 1118, McCamey, Tex.
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Western Optical Co., P.O. Box 208, Salt Lake City, Utah
Courtney, Smith, Co., 7th & Bainbridge St., Richmond, Va.
Haseltine, J. E., & Co., 519 First Ave., S., Seattle, Wash.
Freedman, S., & Sons, 618 K St., N.W., Washington, D.C.
Universal Safety Equipment Co., 3115 S. Seventh St., Milwaukee, Wis.
Industrial Safety Supply Co., 5518 MacCorkle Ave., S.E., Charleston, W. Va.
Safety First Supply Co., 1594 Jackson St., Charleston, W. Va.
Safety First Supply Co., 1 Garland Ave., Wheeling, W. Va.
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225 Stevens St., S. W.
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Younger, Harry C., Company, 1170 Laurel St., Pasadena, Calif.
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Walsh, John F., 180 Boiling Rd., N.E., Atlanta, Ga.
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Kelly, Lawrence W., 5 Coolidge Rd., Marblehead, Mass.
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Southern Sales Company, 514 Court St., Jackson, Miss.
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Macauley, J. S., 1203 S. 54th St., Omaha, Neb.
Romanis, Vern, 2500 Bellaire Rd., Cleveland, O.
Thomas, O. J., Company, 5905 S.W. Patton Rd., Portland, Ore.
Bahram, Ellsworth V., Inc., 231 E. Market St., Bethlehem, Pa.
Keller, Fritz, Company, 3341 Winthrop, Fort Worth, Tex.
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Industrial Chemical Laboratories, 1015 N. 14th St., Omaha, Neb.
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Lehara Corporation, 60 E. 42 St., New York, N.Y.
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Aspden Associates, Inc., 1002 Battleground Ave., Greensboro, N.C.
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North Coast Chemical & Soap Works, 6300 17th Ave., S., Seattle, Wash.
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Clymar Sales Co., 416 W. Walnut, Milwaukee, Wis.

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Stone, Allen S., 277 Broadway, New York, N.Y.
Lax, Peter E., Co., 13945 Lake Ave., Cleveland, Ohio
Davidson, W. H., Co., P.O. Box 351, Wayne, Pa.
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McDonald, R. F., Co., 3745 Greenbriar Dr., Houston, Tex.
Mine Safety Appliances Co., 257 Rio Grande St., Salt Lake City, Utah
Universal Safety & Fire Equip. Co., 727 So. W. Temple, Salt Lake City, Utah
Mine Safety Appliances Co., 71 Columbia St., Seattle, Wash.
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Spokane Safety Appliance Co., 219 Division St., Spokane, Wash.
Mine Safety Appliances Co., 1513 Bluefield Ave., Bluefield, W. Va.
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Pagel Safety Products, Inc., 4611 W. National Ave., Milwaukee, Wis.
Gaspro Ltd., 458 Kuwili St., Honolulu, Hawaii
Safety Consultants, P.O. Box 1518, Honolulu, Hawaii

Emarco Corp.
Box 615, Far Hills Sta., Dayton, Ohio

Embosograf Corp. of America
38 W. 21st St., New York 10, N. Y.

Emergency Oxygen Inhalators, Inc.
654 Madison Ave., N. Y. 21, N. Y.

Emerson, J. H., Co. **265**
22 Cottage Park Ave., Cambridge 40, Mass.
DISTRIBUTORS:
Curtis, L. N., & Sons, 5814 College Ave., Oakland, Calif.
Cleveland, Harold E., 1896 Hanford Dr., Pasadena, Calif.
Gebhard, Paul, 610 Fair Oaks Ave., Oak Park, Ill.
Smith, C. E., 46 Temple St., Arlington, Mass.
Bennett, Otis V., 630 Pearl Ave., Kirkwood, Mo.
Valente, A. S., 65 Harbor Lane, Massapequa Park, N.Y.
Kidd, James E., 629 Spruce Lane, Villanova, Pa.
Berne, W. E., P.O. Box 5245, Columbia, S.C.
Curtis, L. N., & Sons, 432 W. Third So., Salt Lake City, Utah
Curtis, L. N., & Sons, 1204 Westlake Ave. No., Seattle, Wash.
Ingram & Bell, Ltd., 256 McCaul St., Toronto, Ont., Canada

Employers Mutuals of Wausau **274**
Wausau, Wisc.
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1243 S. Wabash Ave., Chicago 5, Ill.

Ericson Manufacturing Company **226**
5209 Euclid Ave., Cleveland, Ohio

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Falcon Alarm Co., Inc. **253**
243 Broad St., Summit, N. J.

Far-Ex Corp.
75 West St., New York 6, N. Y.

Federal Flooring Corp. **26**
82 Dedham St., Boston, Mass.
BRANCH OFFICE:
60 E. 42nd St., New York, N.Y.

Federal Sign & Signal Corp.
8725 S. State St., Chicago 19, Ill.

Feedrail Corp.
125 Barclay St., New York, N. Y.
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Allied Industries, 412 Seaton St., Los Angeles, Calif.
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Willard, Newell L., Co., 2144 Welton St., Denver, Colo.
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Glenn Associates, Inc., 916 Langford Bldg., Miami, Fla.
Glenn Associates Inc., 172 Simpson St., N.W., Atlanta, Ga.
Triangle Equip. Co., Inc., 619 W. Van Buren St., Chicago, Ill.
Warble, Clyde, & Associates, 1437 Gent Ave., Indianapolis, Ind.
Central Sales Agency, 2717 Menlo Dr., Wichita, Kans.
Weyhing, J. Louis, 1914 Rutherford Ave., Louisville, Ky.
Hagen, E. J., 50 Egret St., New Orleans, La.
Kelly, Edward W., 470 Statler Bldg., Boston, Mass.
Ecclestone, S. P., & Sons, Inc., 18089 James Couzens Hwy., Detroit, Mich.
Cooper Page Co., 617 National Bldg., Minneapolis, Minn.
Moschner, Forrest, 1246 Hampton Ave., St. Louis, Mo.
White, William R., Co., 1614 Chicago St., Omaha, Nebr.
Triangle Equip. Co., Inc., 45 River Rd., Nutley, N.J.
Triangle Equip. Co., Inc., 50 Church St., New York, N.Y.
Triangle Equip. Co., Inc., 133 Southview Terrace, Rochester, N.Y.
Glenn & Larson of Carolina, Inc., 123 Brevard Court, Charlotte, N.C.
Martin & Redmond Co., P.O. Box 2682 (A-6X Roselawn Center Bldg.), Cincinnati, O.
Wagner-Green Co., The, 1935 Euclid Ave., Cleveland, Ohio
Adelphia Electric Co., 125 N. 10th St., Philadelphia, Pa.
Squires, M. B., Co., 1 Cedar Blvd., Pittsburgh, Pa.
Tutte, Jim, Co., P.O. Box 11532 (9259 Vinewood Dr.), Dallas, Tex.
Will, E. A., 534 First Ave., So., Seattle, Wash.

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Safety Equip. & Supply, 1724 W. Main St., Fort Wayne, Ind.
Ellis Safety Products Co., 3450 Michigan Ave., East Chicago, Ind.
Iowa Safety Equip. Co., 414 W. 12th St., Des Moines, Iowa
A-1 Safety Supply, Rt. 3, Box 545, Anchorage, Ky.
Hub Industrial Equip., 18 Nightingale Path, Newton Centre, Mass.
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Zink Safety Equip. Co., 709 W. 12th St., Kansas City, Mo.
Notte Safety Appl. Co., 308 Main St., East Orange, N.J.
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Standard Glove Co., 13200 Woodworth Rd., Cleveland, Ohio
Pendergast, Albert W., Safety, 6913 Tulip St., Philadelphia, Pa.
Industrial Optical Co., 1435 Calder, P.O. Box 28, Beaumont, Tex.
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Adams, Carman, Inc., 15760 James Couzens Hwy., Detroit, Mich.
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Naylor Elec. Co., 1115 Hill's Bldg., Syracuse, N.Y.
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Rousseau Controls Ltd., 2379 Yonge St., Toronto, Ont., Can.
Rousseau Controls Ltd., 640 Decourcelle St., Montreal 36, P. Q., Canada

Fibre-Metal Products Co. 115
5th & Tilghman, Chester, Penna.
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211 E. 19th St., New York 3, N. Y.
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18230 Grand River Ave., Detroit, Mich.
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Route 2, Box 6553, Issaqua, Wash.
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Jackson, W. Floyd, Co., 1071 DuPont Bldg., Wilmington, Del.
Galligan, James A., Co., 2246 E. 73rd St., Chicago, Ill.
Powell Distributors, 1791 Elm View Drive, New Albany, Ind.
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Amelia, J. Donald, P.O. Box 6759, Towson, Baltimore, Md.
Industrial Associates, 79 Milk St., Boston, Mass.
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Webber, Robert, 1500 Porterville Rd., East Aurora, N.Y.
Clark, H. B., P.O. Box 645, Cortland, N.Y.
Aerodyne Development Corp., 7300 Bessemer Ave., Cleveland, Ohio
Ostroff, B., 701 Investment Bldg., Pittsburgh, Pa.
Dyess Co., The, 3121 Benbrook Blvd., Ft. Worth, Texas
Rishkin, Sam L., 1803 Dallas Ave., Houston, Texas
Virginia-Carolina Safety Equip. Co., P.O. Box 34, Waverly, Va.
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Hurst, George W., 72 Whitten St., Richland, Wash.

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de Schaeck, Paul, 225 E. 74th St., New York, N.Y.
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Tilman, Leonard L., 520 Valley Rd., Charlottesville, Va.
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121 N. Broad St., Philadelphia, Pa.
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Holmes, C., Co., Cincinnati, Ohio
Anchor Shipping Equip., Cleveland, Ohio
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Lightstone Sales, Montreal, Quebec, Can.

Flents Products Co., Inc. 84
103 Park Ave., New York, N. Y.
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Dickson Safety Products Co., 12921 W. Washington Blvd., Los Angeles, Calif.
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McDonald, B. F., Co., 5721 W. 96th St., Los Angeles, Calif.
Bullard, E. D., Co., 275 Eighth Ave., San Francisco, Calif.
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Becker Surgical Supply, 4744 N. Western Ave., Chicago, Ill.
Karel First Aid Supply Co., 4342 Ogden Ave., Chicago, Ill.
Standard Safety Equip. Co., 232 W. Ontario St., Chicago, Ill.
Universal Safety Equipment Co., 5115 W. Diversey Ave., Chicago, Ill.
Medical Arts Surgical Supply, 307 Second St. S.E., Cedar Rapids, Iowa
Orr Safety Equipment Co., 300 E. Main St., Louisville, Ky.
Smith, R. T., Co., Inc., Charles St. at Biddle, Baltimore, Md.
Detroit First Aid Co., 6335 Grand River Ave., Detroit, Mich.
Randolph Surgical Supply Co., 60 W. Columbia St., Detroit, Mich.
Flint Medical & Surgical Supply Co., 625 S. Saginaw St., Flint, Mich.
Medical Arts Supply Co., 233 Washington St. S.E., Grand Rapids, Mich.
Zink Safety Equipment Co., 700 W. 12th St., Kansas City, Mo.
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Orr Safety Company, 2853 Coleman Ave., Cincinnati, Ohio
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General Scientific Equipment Co., 27th & Huntington Sts., Philadelphia, Pa.
Williams & Company, Inc., 901 Pennsylvania Ave., Pittsburgh, Pa.
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Safety Equipment Distributing Co., 852 W. Main Ave., Knoxville, Tenn.
White Surgical Supply Co., 515 W. Church Ave., Knoxville, Tenn.
Clement Safety Equipment, Inc., 720 S. Third St., Memphis, Tenn.
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Nashville Surgical Supply Co. Inc., 219 Public Square, Nashville, Tenn.
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No. Miro & Japonica Sts., New Orleans, La.
Mathieson Building, Baltimore, Md.
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Foshay Tower, Minneapolis, Minn.
1709 Ambassador Bldg., St. Louis, Mo.
Liberty Bank Bldg., Buffalo, N.Y.
405 Lexington Ave., New York, N.Y.
Carew Tower, Cincinnati, Ohio
Union Commerce Bldg., Cleveland, Ohio
LeVeque Lincoln Tower, Columbus, Ohio
Suburban Station Bldg., Philadelphia, Pa.
No. 3 Gateway Center, Pittsburgh, Pa.
Room 712—Edway Bldg., Memphis, Tenn.
Republic National Bank Bldg., Dallas, Tex.
1113 Texas National Bank Bldg., Houston, Tex.

Junkin Safety Appliance Co. ..222, 223, 260
3121 Millers Lane, Louisville, Ky.

DISTRIBUTORS:
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Safety Engineering & Supply Co., P.O. Box 111, Mobile, Ala.
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Guardian Safety Equip. Co., 7233 S. Main St., Los Angeles, Calif.
Curtis, L. N., & Sons, 5814 College Ave., Oakland, Calif.
Brenton Equip. Co., 374 Brannan St., San Francisco, Calif.
Western Surgical Supply Co., 544 Mission St., San Francisco, Calif.
Bullard, E. D., Co., 2080 Bridgeway, Sausalito, Calif.
Mine & Smelter Supply Co., 1422 Seventeenth St., Denver, Colo.
Safety Equip. Co., 1630 Seventeenth St., Denver, Colo.
Direct Sales Co., 79 North Main St., Waterbury, Conn.
Guardian Safety Equip. Co., 427½ Moreland Ave. N.E., Atlanta, Ga.
Safety Equip. & Supply Co., 104 King St., La Grange, Ga.
Intermountain Equip. Co., Broadway & Myrtle Sts., Boise, Idaho
Karel First Aid Supply Co., 4342 Ogden Ave., Chicago, Ill.
McMaster Carr Supply Co., 640 W. Lake St., Chicago, Ill.
Standard Safety Equip. Co., 232 W. Ontario St., Chicago, Ill.
Universal Safety Equip. Co., 5115 W. Diversey Ave., Chicago, Ill.
MacGill, William V., Co., 549 N. Spaulding Ave., Chicago, Ill.
Standard Industrial Products Co., 920 N. Garfield Ave., Peoria, Ill.
Specialized Mill Supply Co., 409 N. Main St., Goshen, Ind.
Orr Safety Equip. Co., 1914 Cass Ave., Evansville, Ind.
Iowa Safety Equip. Co., 414 12th St., Des Moines, Iowa
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Carey Machinery & Supply Co., 2501 Brehms Lane, Baltimore, Md.
American Fire Equip. Co., 717 Boylston St., Boston, Mass.
Argus Supply Co., 4340 E. Davison Ave., Detroit, Mich.
Averill Equip. Co., 19225 Conant Ave., Detroit, Mich.
Boyer-Campbell Co., 6540 St. Antoine St., Detroit, Mich.
Beco Safety Products Co., 1300 West Fort St., Detroit, Mich.
Safety Services Inc., 1903 W. Main St., Kalamazoo, Mich.
W.P. & R.S. Mars Co., 322 W. Michigan St., Duluth, Minn.
Stone, Chas. W., Co., 1619 Marquette Ave., Minneapolis, Minn.
Continental Safety Equip. Co., 1551 Selby Ave., St. Paul, Minn.

Please mention National Safety News when contacting any of these organizations.

Zink Safety Equip. Co., 700 W. 12th St., Kansas City, Mo.
Aloe, A. S., Co., 1831 Olive St., St. Louis, Mo.
Pulmosan Safety Equip. Corp., 1067 Washington St., St. Louis, Mo.
Safety Inc., 2608 Olive St., St. Louis, Mo.
Notte Safety Appliances Co., 308 Main St., East Orange, N.J.
Times Industrial Supply Corp., 166 Pavonia Ave., Jersey City, N.J.
Safeguard Industrial Equip. Co., 271 Verona Ave., Newark, N.J.
Standard Safety Equip. Co., 597 Broadway, Newark, N.J.
Guardian Safety Equip. Co., 400 S. Jefferson, Orange, N.J.
Pulmosan Safety Equip. Corp., 644 Pacific St., Brooklyn, N.Y.
American Allsafe Co., 1245 Niagara St., Buffalo, N.Y.
Steinwach's Safety Supply Co., 1573 South Park Ave., Buffalo, N.Y.
Rochester Safety Equip. Co., 83 Howell St., Rochester, N.Y.
Acme Safety Products Co., 387 Storer Ave., Akron, Ohio
Orr Safety Equip. Co., 2853 Colerain Ave., Cincinnati, Ohio
Martinson-Nicholls Co., 14062 Euclid Ave., Cleveland, Ohio
Safety Clothing & Equip. Co., 1990 E. 69th St., Cleveland, Ohio
Standard Safety Equip. Co., 855 E. 152nd St., Cleveland, Ohio
Dayton Safety Supply Co., 11 Longworth St., Dayton, Ohio
Guardian Safety Equip. Co., 1742 South Main St., Tulsa, Okla.
Central Safety Equip. Co., 6601 Marsden Ave., Philadelphia, Pa.
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Industrial Products Co., 2820 N. Fourth St., Philadelphia, Pa.
Pendergast, Albert W., 6913 Tulip St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Somers, Fitler & Todd Co., 325 Fort Pitt Blvd., Pittsburgh, Pa.
Chattanooga Surgical Supply Co., 410 McCallie St., Chattanooga, Tenn.
Genter, C. D., Co., 2109 Broad St., Chattanooga, Tenn.
Pfiluger Surgical Supply Co., 930 S. Third St., Chattanooga, Tenn.
Safety Equip. Distributing Co., 832 Main Ave., Knoxville, Tenn.
Clements Safety Equip. Co., 720 South Third St., Memphis, Tenn.
Smalling & Co., 640 Demonbreun St., Nashville, Tenn.
Engineering Supply Co., P.O. Box 6613, Dallas, Tex.
Guardian Safety Equip. Co., 1915 Westheimer, Houston, Tex.
Universal Safety & Fire Equip. Co., 727 W. Temple, Salt Lake City, Utah
Powers & Anderson Inc., 1657 W. Broad St., Richmond, Va.
Spokane Safety Appliance Co., 219 N. Division St., Spokane, Wash.
Safety Equip. & Engineering Co., 1059 Elmore St., Green Bay, Wis.
Pagel Safety Products Co., 4611 W. National Ave., Milwaukee, Wis
Levitt Safety Ltd., 889 Westminster, Winnipeg, Manitoba, Can.
Levitt Safety Ltd., 747 Vaughan Rd., Toronto, Ontario, Can.
Levitt Safety Ltd., 454 Champs de Mars., Montreal, Quebec, Can.

Justrite Mfg. Co.
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BRANCH OFFICE:
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BRANCH OFFICE:
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3401 West Touhy Ave., Chicago, Ill.
2591 West Grand Blvd., Detroit, Mich.
1015 Walnut St., Kansas City, Mo.
81 Industrial Road, Berkeley Heights, N.J.
1154 Hanna Bldg., Cleveland, Ohio
Township Line & Washington Lane, Jenkintown, Pa.
3260 Redwood Dr., Beaumont, Tex.
9213 Sovereign Row, Dallas, Tex.
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Safety Equip. Supply Co., P.O. Box 534, 104 King St., La Grange, Ga.
Protective Equip. Inc., 634 Orleans St., Chicago, Ill.
Protective Equip., Inc., 3231 25th St., Rock Island, Ill.
Cain Safety Service, 1318 Hoyt Ave., Indianapolis, Ind.
Iowa Safety Equip. Co., 414-16 12th St., Des Moines, Iowa
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Williams & Co., Inc., 1109 S. Preston St., Louisville, Ky.
Delta Fire and Safety Equip. Co., P.O. Box 775, Lafayette, La.
Carey Machy. & Supply Co., Inc., 3501 Brehms Ln., P.O. Box 206, Baltimore, Md.
Boyer-Campbell Co., The, 6540 St. Antoine St., Detroit, Mich.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Reis Equip. Co., 1417 Tower Grove Ave., St. Louis, Mo.
Notte Safety Appl. Co., 308 Main St., East Orange, N.J.
Carlsbad Supply Co., P.O. Box 1042, 501 Park Dr., Carlsbad, N. Mex.
Reynolds Industrial Equip. Co., 119 Jericho Turnpike, Floral Park, Long Island, N.Y.
Safe-Quip Inc., 85 Ave. E., Rochester, N.Y.
Steinwachs' Safety Supply, 1573 S. Park Ave., Buffalo, N.Y.
Williams & Co., Inc., 3231 Fredonia Ave., Cincinnati, Ohio
Williams & Co., Inc., 3700 Perkins Ave., Cleveland, Ohio
Williams & Co., Inc., 851 Williams Ave., Columbus, Ohio
Williams & Co., Inc., 946 Kane St., Toledo, Ohio
Sanderson Safety Supply Co., 816 S.E. Hawthorne, Portland, Ore.
Pendergast, Albert W., Safety Equip. Co., 6913 Tulip St., Philadelphia, Pa.
Williams & Co., Inc., 991 Pennsylvania Ave., Pittsburgh, Pa.
Clement Safety Equip., Inc., 720 S. 3rd St., P.O. Box 2586, Memphis, Tenn.
Smalling & Co., 604 Demonbreun St., Nashville, Tenn.
McDonald, B. F., Co., 3745 Greenbriar Dr., Houston, Tex.
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Spokane Safety Appliance Co., N. 219 Division St., Spokane, Wash.
Industrial Safety Supply Co., 5518 MacCorkle Ave., S.E., Charleston, W.Va.
Protective Equip. Inc., 605 S. 12th St., Milwaukee, Wis.
Levitt-Safety, Ltd., 747 Vaughan Rd., Toronto, Ont., Can.
Levitt-Safety, Ltd., 4205 Courtral Ave., Montreal, Can.
Levitt-Safety, Ltd., 889 Westminster Ave., Winnipeg, Can.

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Guardian Safety Equip. Co., 427½ Moreland Ave., Atlanta, Ga.
Universal Safety Equip. Co., 5115 W. Diversey Ave., Chicago, Ill.
Brossard, Lester L., Co., 540 N. Michigan Ave., Chicago, Ill.
Safety & Maintenance Equip., 1095 Alfini Dr., Des Plaines, Ill.
Standard Industrial Prod., 116 S. Garfield, Peoria, Ill.
Safety Equip. & Supply, 1724 W. Main St., Fort Wayne, Ind.
Iowa Safety Equip. Co., 414 Twelfth St., Des Moines, Iowa
Stone, L. R., Co. Supply, 405 N. 6th St., Kansas City, Kan.
National Safety Prod. Co., 116 N. Hamilton St., Saginaw, Mich.
Averill Equip. Co., 19225 Conant Ave., Detroit, Mich.
Safety Services Inc., 1903 W. Main St., Kalamazoo, Mich.
American Allsafe Co., 1245 Niagara St., Buffalo, N.Y.
Acme Safety Prod. Co., 387 Storer Ave., Akron, Ohio
Scallan Supply Co., 2337 Gilbert Ave., Cincinnati, Ohio
Safety Clothing & Equip., 1990 N. 69th St., Cleveland, Ohio
Standard Glove Co., 13200 Woodworth Rd., Cleveland, Ohio
Dayton Safety Supply, 316 Longworth St., Dayton, Ohio
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Safety Equip. Dist. Co., 832 W. Main Ave., Knoxville, Tenn.
Tackaberry, A. G., Co., 2571 Bartlett, Houston, Tex.
Manson, L. A., & Co., 2416 Bolsover, Houston, Tex.
Conney Products, 174 W. Division St., Fond Du Lac, Wis.
Safety Supply Co. Ltd., 5545 Upper Lachine Rd., Montreal, Que., Can.

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Benjamin, Julien P., Equip. Co., P.O. Box 2211, 758 Nicon St., Jacksonville, Fla.
Biscayne Chemical Labs., 200 N.E. 11th St., Miami, Fla.
Bry-Tur, Inc., 1003 Virginia Dr., Orlando, Fla.
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Wilson, Ludwig, Co., 2010 W. 35th St., Chicago, Ill.
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Maintenance Supply Corp., 924 E. Washington St., Springfield, Ill.
Rush Equipment Co., P.O. Box 727, 633 S. Second Ave., Pocatello, Idaho
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AAlen Aides, Inc., 308 E. Ganson St., Jackson, Mich.
Michigan Co., 412 N. Washington Ave., Box 366, Lansing, Mich.
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Homs, J. M., Export Manager, 44 Whitehall St., New York, N.Y.
Carley, Gordon C., 123 N. Madison St., Rome, N.Y.
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Gardner, Hood, Hotel Supply Corp., 109-115 W. First St., Charlotte, N.C.
Johnson Municipal Supply Co., 1122 Buchanan Blvd., Durham, N.C.
Kay Chemical Co., High Point, N.C.
Anderson, James H., Co., 418 W. Peace St., P.O. Box 342, Raleigh, N.C.
Dolge Co., 538 N. Chestnut St., Winston-Salem, N.C.
Leeby, Victor, Co., 1345 Second Ave., N., Fargo, N.D.
Markham, Glen F., Co., 9610 Madison Ave., Cleveland, Ohio
Miller-Norris Co., Inc., 11 N.E. Second St., Oklahoma City, Okla.
Tulsa Paper Co., Box 30, 124 E. Brady St., Tulsa, Okla.
Zellerbach Paper Co., 234 N.W. 5th Ave., Portland, Ore.
Hugues, P. V., & Sons, 4626-32 Baltimore Ave., Philadelphia, Pa.
Carolina Detergents, Inc., 115 E. Orr St., P.O. Box 101, Anderson, S.C.
Southern Chemical Pdts. Co., 1000 King St., Charleston, S.C.
Davis, Geo. T., 734 Poinsettia, Columbia, S.C.
O'Brian Mace Co., Inc., Florence, S.C.
Crown Chemical Co., 232 Union St., Spartanburg, S.C.
Nu-Idea School Supply Co., 230-232 E. Liberty St., Sumter, S.C.
Kiel Bros., Inc., 56 Fourth St., S.W., Huron, S.D.
Southern Products Co., 1005-15 Chestnut St., Chattanooga, Tenn.
Best Supply Co., 2801 Dodds Ave., Chattanooga, Tenn.
Dixie Mfg. Co., 1071 Galloway Ave., Memphis, Tenn.
Slaughter, Hunley A., P.O. Box 6299, E. Memphis Stn., 185 Alexander, Memphis, Tenn.
Mercury Supply Co., 521 5th Ave., S., Nashville, Tenn.
Northrup, L. L., 2804 Canton St., Dallas, Tex.

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Restaurant & Store Equip. Co., 136 S.W. Temple St., Salt Lake City, Utah
Packer-Scott Co., 1232 6th Ave., S., Seattle, Wash.
Smith, K. C., P.O. Box 1845, Charleston, W. Va.
Flint, E. R., & Co., 1000 N. Milwaukee St., Milwaukee, Wis.
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Simplex Floor Finishing Appl., 462 Jean Talon St., W., Montreal, Que., Can.
Admiral Sanitation Ltd., 115 Crockford Blvd., O'Connor Dr., Postal Sta., Toronto, Ont., Can.
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McLaughlin, C. J., 3778 Carter, Detroit, Mich.
Carlson, R. E., 621 - 1st St. N.W., Faribault, Minn.
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Jorgensen, H. P., 818 Broadway, Fresno, Calif.
Morris, R. V., Co., 1531 India St., San Diego, Calif.
Lundergan Sales & Service, 923 Harrison St., San Francisco, Calif.
Simmons, Robert L., 912 Vine St., San Jose, Calif.
Nelson Fire Equipment Co., 920 Inca St., Denver, Colo.
White, Stuart L., 411 Bridgeport Ave., Devon (Milford), Conn.
Knorr, J. Frank, Inc., 528 N.W. Seventh Ave., Miami, Fla.
Gulf Coast Engine Sales, 1916 W. Platt St., Tampa, Fla.
Chief Fire Extinguisher Service, 111 Walton Ave., N.W., Atlanta, Ga.
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McFadden, W. A., c/o Walter Kidde & Co., Inc., 1310-18 W. Randolph St., Chicago, Ill.
Walter Kidde Sales Agency, 519 North 4th St., Springfield, Ill.
Safety Corporation, The, 3740 E. Michigan St., Indianapolis, Ind.
Midwest Automatic Sprinkler Co., Inc., 1821 Raccoon St., Des Moines, Ia.
Kidde Sales & Service, 1125 Kansas Ave., Kansas City, Kans.
Flack, Russell W., 241 N. Glendale Ave., Wichita, Kans.
Walter Kidde Sales & Service of Louisiana, Inc., 915 Galennie St., New Orleans, La.
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Fried, Harry G., P.O. Box 423, Baltimore, Md.
Walter Kidde Sales & Service, 258 Park Square Bldg., Boston, Mass.
Marsh, S. C., c/o Walter Kidde & Co., Inc., 3900 Grandy Ave., Detroit, Mich.
Rahaley, R. M., c/o Walter Kidde & Co., Inc., 3900 Grandy Ave., Detroit, Mich.
Manufacturer's Sales Co., 419 Glenguille, Kalamazoo, Mich.
W. P. & R. S. Mars Co., 324 W. Michigan St., Duluth, Minn.
Chemical Sales & Safety Co., 1499 University Ave., St. Paul, Minn.
Midwest Fire Protection, Inc., 9 S. Vandeventer Ave., St. Louis, Mo.
Sammons, J. Bert, 113—33rd St., North, Great Falls, Mont.
Harmon, Al, & Son, 4524 Farnum, Omaha, Nebr.
Inland Service & Supply Corp., 300 W. Wyoming, Las Vegas, Nev.
Reno Rents, Inc., 1490 E. Second St., Reno, Nev.
Hudson, W. F., c/o Walter Kidde & Co., Inc., 675 Main St., Belleville, N.J.
Associated Fire Protection, Inc., 313 Atlantic St., Paterson, N.J.
Sanders Industrial Equip. Co., 15 Albright Ave., Albany, N.Y.
American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.
Reynolds Industrial Equip. Co., 119 Jericho Turnpike, Floral Park, L.I., N.Y.
Clements, W. E., c/o Walter Kidde & Co., Inc., 140 Cedar St., New York, N.Y.
Zuber, L. B., c/o Walter Kidde & Co., Inc., 140 Cedar St., New York, N.Y.
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M & A Sales and Service, Inc., 1010 Woodward Ave., Charlotte, N.C.
Merritt-Holland Welding Supplies, Inc., 203 Red Cross St., Wilmington, N.C.
Hintz Fire Equip. Co., 1114 Front St., Fargo, N.D.
Proulx, S. E., 1075 Hopkins St., Cincinnati, O.
Smith, S. R., 1200 W. Ninth St., Cleveland, O.
Hard, Harold D., 1626 Hudson St., Columbus, O.
General Fire Sales & Service, 3018 Mulberry St., Toledo, O.
Walter Kidde Sales & Service—Div. of Edwards, Allan, Mfg. Co., Inc., 2445 S. Jackson, Tulsa, Okla.
Huser Sales & Service, 1200 N.W. Glisan St., Portland, Ore.
Bretz, S. S., 62 N. Dawes Ave., Kingston, Pa.
Lavlor, J. H., c/o Walter Kidde & Co., Inc., 101 N. 33rd St., Philadelphia, Pa.
Wurm, J. B., c/o Walter Kidde & Co., Inc., 101 N. 33rd St., Philadelphia, Pa.
Litchfield, A. B., 1117 Pinewood Dr., Pittsburgh, Pa.
Brown, Joseph J., Co., 1631 Narragansett Blvd., Cranton, R.I.
American Fire & Safety Equip. Co., 514 Fifth Ave., S., Nashville, Tenn.
Van Rensselaer, F. R., P.O. Box 394, Norris, Tenn.
Wes-Tex Fire Equip. Co., 342 Chestnut, Abilene, Tex.
Jackson, Dale, 7224 Harry Hines Blvd., Dallas, Tex.
Harman, Jay L., Co., 307 San Francisco St., El Paso, Tex.
Kidde Sales & Service Inc., 2332 N. Wayside Drive, Houston, Tex.
Industrial Supply Co., 121 Social Hall Ave., Salt Lake City, Utah
Paxton Co., 407 Union St., Norfolk, Va.
Nelson-Huser Co., 1404—8th Ave., S., Seattle, Wash.
Property Protection Co., 422 Washington St., W., Charleston, W. Va.
Azco Fire Protection, Inc., Box 228, Hwy. 41, Appleton, Wis.
Phillips, R. A., 602 Oak St., Manitowoc, Wis.
Winter, Harvey J., 523-525 S. 6th St., Milwaukee, Wis.
Alaska Fire Equipment, Inc., Seventeenth & Gambel, Anchorage, Alaska

Kimball Safety Products Co. 123
9310 Wade Park Ave., Cleveland 6, Ohio

Kimberly-Clark Corp.
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527 E. 5th St., Cincinnati, O.
3030 Euclid Ave., Cleveland, O.
1934 N. Front St., Philadelphia, Pa.
1826 Oliver Bldg., Pittsburgh, Pa.

Kip, Inc. 72
778 E. Pico Blvd., Los Angeles 21, Calif.

Klein, Mathias, & Sons
7200 McCormick Rd., Chicago 45, Ill.

Klemp Metal Grating Corp.
6600 S. Melvina Ave., Chicago 38, Ill.

BRANCH OFFICES:
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7700 Wallisville Rd., Houston, Tex.

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Metal Products Division
200 Scott St., Baltimore, Md.

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55 New Montgomery St., San Francisco, Calif.
111 Lafayette St., Hartford, Conn.
122 S. Michigan Ave., Chicago, Ill.
250 Stuart St., Boston, Mass.
1212 United Artists Bldg., Detroit, Mich.
430 Park Ave., New York, N.Y.
1900 Euclid Bldg., Cleveland, Ohio
355 Lancaster Ave., Haverford, Pa.
2320 Koppers Bldg., Pittsburgh, Pa.

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Hoagland, Carns, Co., 420 N. 15th Ave., Phoenix, Ariz.
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C & S Equipment Co., Inc., 2103 S. San Pedro St., Los Angeles, Calif.
Cooley, E. C., Co., 1331 "T" St., Sacramento, Calif.
Cooley, E. C., Co., 1186 Folsom St., San Francisco, Calif.
Air Purification Co., 2405 W. 32nd Ave., Denver, Colo.
Simons, Joseph, Co., 26 Wethersfield Ave., Hartford, Conn.
Day, Irving M., Co., 723 Mills Bldg., Washington, D.C.
McMurry, H. L., & Co., 614 Fields Ave., Jacksonville, Fla.
McMurry, H. L., & Co., 33 N.E. 6th St., Miami, Fla.
Acousti Engrng. Co., 188 Walker St., S.W., Atlanta, Ga.
Maher Engineering Co., 4535 W. Peterson Ave., Chicago, Ill.
Paller Engrng. Co., 2212 S. Calhoun St., Fort Wayne, Ind.
Paller Engrng. Co., 3625 N. Illinois St., Indianapolis, Ind.
Engineering Sales Co., 4824 Woodside Drive, Baton Rouge, La.
Engineering Sales Co., 171 Audubon Blvd., New Orleans, La.
Higgins, Elliot W., 20009 James Couzens Highway, Jackson, Miss.
Childress & Co., 1021-23 S. Big Bend Blvd., St. Louis, Mo.
Big Horn Supply, Inc., 2116 3rd Ave., North, Billings, Mont.
Boyd Engrng. Co., Inc., 112 W. Granite Ave., N.W., Albuquerque, N.M.
Stevens, C. V., Electrical Equip., 13 Cayuga Rd., Buffalo, N.Y.
Caton, Howard V., Co., 230 N. Torrence St., Charlotte, N.C.
Gorgen Co., The, 60—16th Ave., N., Fargo, N.D.
Frey Equipment Co., 410 W. First St., Dayton, Ohio
Turner, William S., Co., 520 S.W. Yamhill St., Portland, Ore.
Busch Co., 4318 Penn Ave., Pittsburgh, Pa.
Pawkett, L. S., & Co., Corpus Christi, Tex.
Boyd Engineering Co., 609 Laurel St., El Paso, Tex.
Marshall, Neil & Pauley, Inc., 3513 W. Dallas Ave., Houston, Tex.
Pawkett, L. S., & Co., N. St. Marys St. at Evergreen Ct., San Antonio, Tex.
Mayrock, A. A., Co., 234 Seventh Ave., Salt Lake City, Utah
Trant, Laurence, & Co., 111 W. Main St., Norfolk, Va.

Kosch Mfg. Co.
Columbus, Neb.

Kruger, Harold, Instruments
P. O. Box 164, San Gabriel, Calif.

—L—

Landauer, R. S., Jr. and Co. 266
24 Plaza, Park Forest, Ill.

Laughlin, Thomas Div.—
American Hoist & Derrick Co.
St. Paul 1, Minn.

Leader Manufacturing Co., Inc.
133 Woodside Ave., Briarcliff Manor, N.Y.

DISTRIBUTORS:
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Grinnell & Sons, 2554 N. Stone Ave., Tucson, Ariz.
Leeder Fire Ext. Co., 2962 Daneland, Lakewood, Calif.
Leeder Fire Protection Co., 420 Market St., San Francisco, Calif.
Fire Control Service, 233 Wooster St., New Haven, Conn.
Hartford Fire Extinguisher, 31 Walnut St., Hartford, Conn.
State Fire Exting. Service, Todd Hollow Rd., Terryville, Conn.
Miami Fire Equipment Co., 150 S.W. 27th Ave., Miami, Fla.
Fountain Fire Protection, 1006 E. Hillsborough, Tampa, Fla.
Ross, J. J., 254 E. Paces Ferry Rd., N.E., Atlanta, Ga.
Teas, Chas. R. & Co., 12911 S. Union Ave., Chicago, Ill.
Fredrickson & Sons, 6155 Belmont Ave., Chicago, Ill.
Midwest Fire & Safety Equip., 1605 Prospect St., Indianapolis, Ind.
Fesco Fire Equipment, 906 S. 18th St., Louisville, Ky.
Blanchard Associates, Winthrop, Me.
Clougherty, Chas. A., Co., 39 Miller St., Medfield, Mass.
Deane & Marcil, Amity Court, Springfield, Mass.
Lakeside Fire Ext. Service, 5909 W. Huron, Pontiac, Mich.
Miller Fire Protection Co., Saginaw, Mich.
Seco Safety Products, 1300 W. Fort St., Detroit, Mich.
Hay, George, P. O. Box 587, Springfield, Mo.
Kirkwood Chemical Co., P. O. Box 3772, Kirkwood, Mo.
Absolute Fire Protection, 2900 Woodland Ave., S. Plainfield, N.J.
Kennedy, J. W., Co., 530 Perry St., Trenton, N.J.

Please mention National Safety News when contacting any of these organizations.

Reliable Extinguisher Co., 212 French St., New Brunswick, N.J.
Central New York Distributors, 127 S. Fourth Ave., Ilion, N.Y.
Pioneer Extinguisher Corp., 133 Woodside Ave., Briarcliff Manor, N.Y.
Fire Equipment Sales, 6 Winspear Ave., Buffalo, N.Y.
Liberty Fire Equipment, 323 N. Main St., Liberty, N.Y.
Midway Fire Equipment Co., 32 Mansion St., Poughkeepsie, N.Y.
Rochester Fire Equipment, 83-85 Howell St., Rochester, N.Y.
Smith, Mrs. Alice, 189 N. Central Ave., Elmsford, N.Y.
Tech Supply Co., 52 Hawk St., Albany, N.Y.
Atomic Fire Extinguisher Co., 4163 Detroit Ave., Cleveland, Ohio
Fire Protection Co., 565 Brooklyn Ave., Dayton, Ohio
Fyr-Fyter Sales & Service, 8 W. Central Parkway, Cincinnati, Ohio
Mannweiler, A. J., & Sons, P. O. Box 504, Massilon, Ohio
Propane Equipment Co., P. O. Box 5123, Columbus, Ohio
Safety-First of Steubenville, 1403 Market St., Steubenville, Ohio
Fire Appliance & Supply Co., 152 W. Reno, Oklahoma City, Okla.
Litzler Supply Co., Houtzdale, Pa.
Schwartz Brothers, Inc., 827 Arch St., Philadelphia, Pa.
Fire Protection, Inc., 1306 N. Lincoln Ave., Aberdeen, S. Dak.
Chattanooga Welding Supply, 306-12 West 23rd St., Chattanooga, Tenn.
Alamo Fire Equipment Co., 626 N. Leona, San Antonio, Tex.
Reed, L. F., Rob, 2910 - 20th St., Lubbock, Tex.
Reynolds Fire Equipment, 1734 S. Barry Ave., Dallas, Tex.
Southwest Equipment & Ext. Co., 526 Palm Dr., Corpus Christi, Tex.
Virginia Carolina Safety Equip., P. O. Box 34, Waverly, Va.
Washington Equipment Co., 85 Spring St., Seattle, Wash.
Emsweiler, R. P., 381 Mulberry St., Morgantown, W. Va.
Booth, B. J., Jr., 1415 Spring Valley, Huntington, W. Va.
Booth, B. J., Co., P. O. Box 1632, Huntington, W. Va.
Morgan, W. W., 2741 Jacob St., Wheeling, W. Va.
Wisconsing Recharging Service, 9026 W. National Ave., Milwaukee, Wis.

Legge, Walter G., Co., Inc. 37
101 Park Ave., New York 17, N. Y.
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1612 W. Weldon, Phoenix, Ariz.
3944 Wilshire Blvd., Los Angeles, Calif.
3871 Piedmont Ave., Oakland, Calif.
3801 High St., Denver, Colo.
119 Ann St., Hartford, Conn.
611 N.W. 5th St., Miami, Fla.
101 Sheryl Place, N.W., Atlanta, Ga.
360 N. Michigan Ave., Chicago, Ill.
30 Harvard Court, Brookline, Mass.
18440 W. McNichols, Detroit, Mich.
6635 Delmar Blvd., St. Louis, Mo.
222 Searlwyn Rd., Syracuse, N.Y.
606 Williamson Bldg., Cleveland, Ohio
1239 Ridge Ave., Philadelphia, Pa.
1123 Park Bldg., Pittsburgh, Pa.
10939 Cinderella Lane, Dallas, Tex.
964 Denny Way, Seattle, Wash.
4106 N. 24th Place, Milwaukee, Wis.

Lehigh Safety Shoe Co. 142-143
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First and Minor Sts., Emmaus, Pa.

Libbey-Owens-Ford Glass Co.
Nicholas Bldg., Toledo, Ohio

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Box 987, Gloversville, N. Y.

Lightfoot Schultz Co. 72
380 Madison Ave., New York 17, N. Y.
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11700 Nardin Ave., Detroit, Mich.
306 N. Filmore Ave., Kirkwood, Mo.
270 Hick St., Brooklyn, N.Y.
2763 N. Bend Rd., Cincinnati, Ohio
1836 Euclid Ave., Cleveland, Ohio
6929 Sylvester St., Philadelphia, Pa.
6605 Ridgeville St., Pittsburgh, Pa.
5019 W. Galena St., Milwaukee, Wis.

Lindstrom Mfg. Co., Inc.
173 Water St., N. Y. 38, N. Y.

Link-Belt Co.
307 N. Michigan Ave., Chicago 1, Ill.

Littell, F. J., Machine Co.
4127 Ravenswood Ave., Chicago 13, Ill.
BRANCH OFFICES:
4555 Ravenswood Ave., Chicago, Ill.
2842 W. Grand Blvd., 414 Curtis Bldg., Detroit, Mich.
815 Superior Ave., 717 NBC Bldg., Cleveland, O.

Lord-Taber Co., Inc.
40 Ontario St., Canandaigua, N. Y.
Florance Electric Supply Co., Inc., 15 S. Washington St., Binghamton, N.Y.
Hunter & Bell, 858 Main St., Buffalo, N.Y.
Brady Supply Corporation, 255-59 State St., Elmira, N.Y.
Montano Electrical Supply Co., 369 So. Main St., Gloversville, N.Y.
Norton Electric Co., 1013 W. State St., Ithaca, N.Y.
Sans Corp., Blackstone Ave., Jamestown, N.Y.
Perricelli Fire Equipment Co., 305 Gluck Bldg., Falls St., Niagara Falls, N.Y.
Northern Fire Protection Service, 67 Elm St., Potsdam, N.Y.
Automatic Fire Detection Co., 12 Belvedere Dr., Rochester, N.Y.
Glenn Davis Co., 111 S. Church St., Schenectady, N.Y.
Electrical Control Services, Box 32, Sugar Loaf, N.Y.
Link Fire Equipment Service, 1415 Lincoln Ave., Utica, N.Y.

Loss Control Assoc.
629 Oakmont Dr., Plattsmouth, Neb.

Lowery Bros.
9340 S. Anthony Ave., Chicago 17, Ill.
BRANCH OFFICES:
4217 Gary Ave., Fairfield, Ala.
1925 N.W. 22nd Ave., Portland, Ore
Vancouver, Wash.

Luxo Lamp Corp.
102 Columbus Ave., Tuckahoe, N. Y.
BRANCH OFFICES:
464 Bryant St., San Francisco, Calif.
185 Laganchetiere St., W. Montreal, Quebec, Can.

—M—

M-B Corp.
New Holstein, Wis.

Macwhyte Company 197
2902 14th Ave., Kenosha, Wis.
BRANCH OFFICES:
2035 Sacramento St., Los Angeles, Calif.
188 King St., San Francisco, Calif.
228 S. Desplaines St., Chicago, Ill.
75 Oakman Blvd., Detroit, Mich.
2356 Hampden Ave., St. Paul, Minn.
1603 N.W. 14th Ave., Portland, Ore.
704 Second Ave., Pittsburgh, Pa.
T&P Terminal Whse., Ft. Worth, Tex.
87 Holgate St., Seattle, Wash.
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1952 Mercer St., Pinconning, Mich.

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Maico Co., Inc. 89
21 N. 3rd St., Minneapolis, Minn.

Master Builders Co.
7016 Euclid Ave., Cleveland 3, Ohio

Master Lock Company
2600 N. 32nd St., Milwaukee, Wis.
DISTRIBUTORS located in principal cities.

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4765 Bellevue Ave., Detroit, Mich.
425 E. 8th St., St. Paul, Minn.
933 Mulberry St., Kansas City, Mo.
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Matthews, Jas. H., & Co.
3922 Forbes St., Pittsburgh 13, Pa.
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470 Atlantic Ave., Boston, Mass.
1151 Bloomfield Ave., Clifton (Allwood), N.J.
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Mathias Klein & Sons
7200 McCormick Rd., Chicago, Ill.
DISTRIBUTORS located in principal cities.

McAn, Thom, Safety Shoe Div. 153
25 W. 43rd St., New York 18, N. Y.
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5721 W. 96th St., Los Angeles 45, Calif.
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Pittsburgh 9, Pa.

McGill Mfg. Co., Inc.
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2517 Eleventh Ave., Los Angeles, Calif.
5821 N.E. Glisan St., Portland, Ore.
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Medical Supply Co., Rockford, Ill.

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1027 W. State St., Rockford, Ill.
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Brenton Equipment Co., 374 Brannan St., San Francisco, Calif.
Union Supply Co., 5460 Colorado Blvd., Denver, Colo.
Cameron & Barkley Co., 605 E. Forsyth St., Jacksonville, Fla.
Medical Supply Co., 230 N.E. Third St., Miami, Fla.
Cameron & Barkley Co., P.O. Box 2748, Orlando, Fla.
Cameron & Barkley Co., P.O. Box 990, Tampa, Fla.
Medical Supply Co. of W. Palm Beach, 526 24th St., W. Palm Beach, Fla.
Guardian Safety Equipment Co., 427½ Moreland Ave. N.E., Atlanta, Ga.
Cameron & Barkley Co., 12 Water St., Savannah, Ga.
Protective Equipment Inc., 634 Orleans St., Chicago, Ill.
Orr Safety Equipment Co., 300 E. Main St., Louisville, Ky.
Standard Supply & Hardware Co., 832 Tchoupitoulas St., New Orleans, La.
Seco Safety Products Co., 1300 W. Fort St., Detroit, Mich.
Seco Safety Products Co., 317 Lake Michigan Drive, Grand Rapids, Mich.
Safety Incorporated, 17½ E. 31st St., Kansas Mo.
Safety Incorporated, 2608 Olive St., St. Louis, City, Mo.
Montana Hardware Co., 823 Montana St., Butte, Mont.
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Union Supply Co., Inc., Box 458, Artesia, N.M.
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Union Industrial Corp., P.O. Box 710, Carlsbad, N.M.
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American Allsafe Co., Inc., 1245 Niagara, Buffalo, N.Y.
Elwood Corporation, 2180 Elmwood Ave. at Hinman, Buffalo, N.Y.
Whitaker & Higgins, Inc., 163 Bleecker St., New York, N.Y.
American Allsafe Co., Inc., 2704 Erie Blvd. E., Syracuse, N.Y.
Smith-Courtney Co., 241 S. Davis St., Greensboro, N.C.
Williams and Co., Inc., 3231 Fredonia Ave., Cincinnati, Ohio
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Williams and Co., Inc., 900 Williams Ave., Columbus, Ohio
Williams and Co., Inc., 650 E. Woodruff Ave., Toledo, Ohio
Guardian Safety Equipment Co., 1742 S. Main St., Tulsa, Okla.
Haseltine, J. E., & Co., 2nd Ave. & Ash St., Portland, Ore.
Wilco Fire Equipment Co., 1123 S.E. Market St., Portland, Ore.

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Williams and Co., Inc., 901 Pennsylvania Ave., Pittsburgh, Pa.
Cameron & Barkley Co., P.O. Box 906, Charleston, S.C.
Massey Surgical Supply Inc., 58 N. Market St., Chattanooga, Tenn.
Massey Surgical Supply Inc., 411 W. Main Ave., Knoxville, Tenn.
Massey Surgical Supply Inc., 2110 W. End Ave., Nashville, Tenn.
Union Supply Co., Box 456, Aspermont, Tex.
Settle Safety Supply Co., 5405 Swiss Ave., Dallas, Tex.
Union Supply Co., 1715 Republic Bank Bldg., Dallas, Tex.
Allied Safety Equipment Inc., 361 M & M Bldg., Houston, Tex.
Settle Safety Supply Co., 207 N. Amburgey, Odessa, Tex.
Union Supply Co., P.O. Box 218, Sundown, Tex.
Universal Safety & Fire Equip. Co., 727 S.W. Temple St., Salt Lake City, Utah
Southern Medical Supply Co., P.O. Box 113, Richmond, Va.
Haseltine, J. E., & Co., 510 First Ave., Seattle, Wash.
Wilco Fire Equipment Co., 408 Broad St., Seattle, Wash.
Haseltine, J. E., & Co., 1101 N. Division St., Spokane, Wash.
Protective Equipment Inc., 605 S. 12th St., Milwaukee, Wis.
Union Supply Co., Box 447, Casper, Wyo.
Safety Supply Co., 214 King St. E., Toronto, Ont., Can.
w/their various branches in Halifax, Montreal, Ottawa, Winnipeg, Calgary, Edmonton, Trail and Vancouver.

Melflex Products Co.
410 S. Broadway, Akron 8, Ohio

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Behn, H. J., Co., Bridgeport, Conn.
Bleiler Equip. Co., 579 New Park Ave., West Hartford, Conn.
Metzger, A. P., 175 E. 15th Rd., Miami, Fla.
Boykin Tool & Supply Co., 67 Courtland St., Atlanta, Ga.
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Williams & Co., 3231 Fredonia Ave., Cincinnati, Ohio
Williams & Co., 3700 Perkins Ave., Cleveland, Ohio
Williams & Co., 851 Williams Ave., Columbus, Ohio
Williams & Co., 946 Kane St., Toledo, Ohio
Hart Industrial Supply Co., 726 W. Grand St., Oklahoma City, Okla.
Woodbury & Co., 133 S.W. Second Ave., Portland, Ore.
Taylor, Wm. H., Co., 250 Hamilton St., Allentown, Pa.
Hanson, E. M., & Co., 134 N. Fifth St., Philadelphia, Pa.
Williams & Co., 901 Pennsylvania Ave., Pittsburgh, Pa.
Congdon & Carpenter, 405 Promenade St., Providence, R.I.
Tennessee Belting & Supply, 419 Depot Ave., Knoxville, Tenn.
Smalling & Co., 604 Demonbreun St., Nashville, Tenn.
Champion Industrial Sales, 5809 Navigation Blvd., Houston, Tex.
Salt Lake Hardware Co., 105 N. 3rd West St., Salt Lake City, Utah
Ryerson, J. T., & Son, 1206 Fourth Ave. S., Seattle, Wash.
Shadbolt & Boyd Co., 413 N. 2nd St., Milwaukee, Wis.
Canadian Fairbanks Morse Co., 980 St. Antoine St., Montreal, P.Q., Canada
Canadian Fairbanks Morse Co., 137 Harbour St., Toronto, Ont., Canada
Canadian Fairbanks Morse Co., 798 Beatty St., Vancouver, B.C., Canada

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101 Sherman Ave., New York 40, N. Y.

Micro Switch, Div. of Minneapolis-Honeywell Regulator Co. 215
Chicago & Spring Sts., Freeport, Ill.

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7350 N. Lincoln, Chicago, Ill.
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1230 Soldiers Field Rd., Boston, Mass.
13631 Plymouth, Detroit, Mich.
2753 Fourth Ave., S., Minneapolis, Minn.
4354 Olive St., St. Louis, Mo.
212 Greystone Rd., Charlotte, N.C.
1909 Superior Ave., Cleveland, Ohio
24-36 Skillman Ave., Long Island City, N.Y.
731 Mount Read Blvd., Rochester, N.Y.
U.S. Route 22 at Springfield Line, Union, N.J.
1441 Milburn Ave., Dayton, Ohio
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Electric Supply Corp., 701 W. Jackson Blvd., Chicago, Ill.
Hackett Brothers, Inc., N. Manchester, Ind.
Electrical Engrg. & Equip. Co., 1201 Walnut St., Des Moines, Ia.
Gilfrin, Inc., 33 Union St., E. Walpole, Mass.
Engineering Sales Corp., 2300 Washington St., Newton Lower Falls, Mass.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Lakeland Engrg. Equip. Co., 116-120 Third Ave., N., Minneapolis, Minn.
Safety Inc., 2608 Olive St., St. Louis, Mo.
Aircomo Corp., 1230 E. Elizabeth Ave., Linden, N.J.
Tri-State Supply Co. of N.Y., 11 Stone Ave., Brooklyn, N.Y.
Buffalo Electric Co., Inc., 75 W. Mohawk St., Buffalo, N.Y.
Electro-Tech Equip Co., 308 Canal St., New York, N.Y.
ReQua Elect. Supply Co., Inc., 91-93 St. Paul St., Rochester, N.Y.
Baldwin-Hall Co., 475 Oswego Blvd., Syracuse, N.Y.
Sullivan Electric Co., The, 836-838 Reedy St., Cincinnati, Ohio
Midland Electric Supply, 2125 Superior Ave., Cleveland, Ohio
SHEPCO, Inc., 314 Leo St., Dayton, Ohio
Allied Northwest Machine Tool Corp., 1222 S.E. 7th Ave., Portland, Oregon
Erie Industrial Elec. Supply Corp., 1562 Cherry St., Erie, Pa.
Technical Products Co., 315 Sherbrook Blvd., Upper Darby, Pa.
Womack Machine Supply Co., 6409 Maple Ave., Dallas, Tex.
Jacobs, Albert A., Co., Inc., 928 N. Jefferson St., Milwaukee, Wis.

Midland Laboratories
210-220 Jones St., Dubuque, Iowa

Midwest Oxygen Equip. Co.
1664 W. Ogden Ave., Chicago, Ill.

Milburn Co.
3246 E. Woodbridge, Detroit 7, Mich.

Miller Equip. Co., Inc. 179
13th & New Sts., Franklin, Pa.
Franklin, Pa.

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Safety Engineering & Supply Co., 617 N. 19th St., Birmingham, Ala.
Safety Engineering & Supply Co., Box 111, Mobile, Ala.
Bullard, E. D., Co., 6719 S. Figueroa St., Los Angeles, Calif.
Bullard, E. D., Co., 275 8th St., San Francisco, Calif.
Safety Equipment Co., Inc., 1630 17th St., Denver, Colo.
Abern Industrial Supply Co., 2 Eld St., New Haven, Conn.
Industrial Safety Supply Co., Inc., 574 New Park Ave., West Hartford, Conn.
Florida Electric Supply, 645 King St., Jacksonville, Fla.
Southeastern Safety Equipment Co., 1010 Crescent Ave., N.E., Atlanta, Ga.
Protective Equipment Inc., 634 Orleans St., Chicago, Ill.
Orr Safety Equipment Co., 1914 Cass Ave., Evansville, Ind.
Iowa Safety Equipment Co., 414-416 12th St., Des Moines, Ia.
Mid-Continent Transmission & Sup. Inc., 2027 N. Broadway, Wichita, Kans.
Orr Safety Equipment Co., 300 E. Main St., Louisville, Ky.
Delta Fire & Safety Inc., Box 775, Scott Rd., Lafayette, La.
Delta Fire & Safety Inc., 523 Magazine St., New Orleans, La.
Delta Fire & Safety Inc., 5743 St. Vincent St., Shreveport, La.
Carey Machinery & Sup. Co., 3501 Brehms Lane, Baltimore, Md.
General Equipment Corp., 261 Franklin St., Boston, Mass.
Mathias-Hart Co., Inc., 152 Market St., Lowell, Mass.
Baird, Everett J., 71 Olean St., Worcester, Mass.
Boyer-Campbell Co., The, 6540 St. Antoine St., Detroit, Mich.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Bourassa, Stanley E., 6141 Russel Ave., Minneapolis, Minn.
Zink Safety Equipment Co., 700 W. 12th St., Kansas City, Mo.
Zink Safety Equipment Co., 1116 S. Brentwood, St. Louis, Mo.
Pulmosan Safety Equipment Corp., 1007 Washington Ave., St. Louis, Mo.
Safeguard Industrial Equip. Co., 271 Verona Ave., Newark, N.J.
Pulmosan Safety Equipment Corp., 644 Pacific St., Brooklyn, N.Y.
American Allsafe Co., 1245 Niagara St., Buffalo, N.Y.
Gehler Supply Co., Box 739, Binghamton, N.Y.
Safety Equipment Service Corp., 166-12 89th Ave., Jamaica, N.Y.
Wilson, W. S., Corp., 47-50 38th St., Long Island City, N.Y.
Acme Safety Products, 387 Storer Ave., Akron, O.
Safety First Supply Co., 1772 W. Market St., Apt. 5-B, Akron, Ohio
Orr Safety Equipment Co., 2853 Colerain Ave., Cincinnati, Ohio
Martinson-Nicholls Co., 14062 Euclid Ave., Cleveland, Ohio
Safety First Supply Co., 4251 W. 35th St., Cleveland, Ohio
Dayton Safety Supply, 11 Longworth St., Dayton, Ohio
North Electric Mfg. Co., Galion, Ohio
Safety First Supply Co., 858 Delaware Ave., Toledo, Ohio
Monarch Machinery & Supply, 1116-24 East Admiral, Tulsa, Okla.
Haseltine, J. E., & Co., S.W. 2nd Ave. & Ash St., Portland, Ore.
Industrial Products Co., 2820 N. Fourth St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Genter, C. D., Co., 2109-15 Broad St., Chattanooga, Tenn.
Clement Safety Equipment Inc., 730 S. 3rd St., Memphis, Tenn.
Smalling & Co., 604 Demonbreaun St., Nashville, Tenn.
Southwest Equip. & Extinguisher Co., 526 Palm Drive, Corpus Christi, Tex.
Allied Safety Equipment, 352 M. & M. Bldg., Houston, Tex.
SM Electric Supply Co., Box 206, San Marcos, Tex.
Lee-Naylor Co., 2565 S. State, Salt Lake City, Utah
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Safety Supply Co., 5545 Upper Lachine Road, Montreal, Quebec, Can.
Fleming, Ferreteria, Inc., Barbosa Ave., Yauco, Puerto Rico
Safety Supply Co., 25 McLean St., Halifax, Nova Scotia
Safety Supply Co., 10206 106th St., Edmonton, Alberta, Can.
Safety Supply Co., 1412 12th Ave., W., Calgary, Alberta, Can.
Safety Supply Co., 214 King St., E., Toronto, Ontario, Can.
Safety Supply Co., 240 E. Tenth Ave., Vancouver, B.C., Can.

Miller Products Co., Inc. 180
29 Warren St., New York 7, N. Y.

Mine Safety Appliances Co. .....IFC
201 N. Braddock Ave., Pittsburgh, Pa.

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144 W. Superior St., Chicago, Ill.
3545 Sutherland Ave., Indianapolis, Ind.
3009 Toulouse St., New Orleans, La.
412 Water St., Baltimore, Md.
20 Huntington Ave., Boston, Mass.
19725 Ralston, Detroit, Mich.
301 Wesley Temple Bldg., Minneapolis, Minn.
1434 Wyandotte St., Kansas City, Mo.
1915 Washington Ave., St. Louis, Mo.
40 Fulton St., Newark, N.J.
1718 Main St., Buffalo, N.Y.
5-45 49th Ave., Long Island City, N.Y.
17901 Euclid Ave., Cleveland, Ohio
1615 S. Cincinnati Ave., Tulsa, Okla.
1017 S.W. Washington St., Portland, Ore.
610 Johnstown Bank & Trust Bldg., Johnstown, Pa.
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367 Grove St., St. Paul, Minn.
3700 Forest Park Blvd., St. Louis, Mo.
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Moore Machinery Co., San Francisco, Calif.
Harron, Rickard & McCone Co., Los Angeles, Calif.
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Hackett, J. Lee, Co., 1961 E. Milwaukee, Detroit, Mich.
McKee, Kenyon, & Co., 1627 Fort St. W., Detroit, Mich.
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Snow, F. J., Co., 333 Old Hood Rd., Westwood, N.J.
Certified Flexible Couplings, 321 E. 233, New York, N.Y.
Syracuse Supply Co., 923 Kensington, Buffalo, N.Y.
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Russell, W. F., Co., 13109 Holbrook, Dallas, Tex.
Smith, Whitcomb & Cook, 442 N. Main, Barre, Vt.
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BRANCH OFFICE:
1007 Washington Ave., St. Louis, Mo.

Puro Filter Corp. of America
51st Ave. & 21st St.,
Long Island City 1, N. Y
BRANCH OFFICES:
50 Brookline Ave., Boston, Mass.
1400 Fourteenth St., Detroit, Mich.
3629 Main St., Kansas City, Mo.
613 Del Monte Way, St. Louis, Mo.
790 Broad St., Newark, N.J.
56 Dott Ave., Albany, N.Y.
4127 Weslow, Houston, Tex.
LICENSEE OFFICES:
Puro Filter Co., 4600 Santa Monica Blvd., Los Angeles, Calif.
Puro Filter Co., 30 Clay St., San Francisco, Calif.
Puro Filter Corp. of Ill., 1338 S. Michigan Ave., Chicago, Ill.
Puro Water Filter Co., 5403 Prospect Ave., Cleveland, Ohio
Puro Filter Co., 1216 Arch St., Philadelphia, Pa.

Putnam Rolling Ladder Co., Inc.
32 Howard St., New York, N. Y.

Pyle-National Co.
1334-58 N. Kostner Ave., Chicago 51, Ill.
BRANCH OFFICES:
837 Traction Ave., Los Angeles, Calif.
988 Market St., San Francisco, Calif.
80 E. Jackson Blvd., Chicago, Ill.
2057 E. LaGrande Ave., Indianapolis, Ind.
629 Madison Ave., Covington, Ky.
479 Statler Office Bldg., Boston, Mass.
16525 Woodward Ave., Detroit, Mich.
1608 Pioneer Bldg., St. Paul, Minn.
532 Arcand Bldg., St. Louis, Mo.
Karbach Bldg., Rm. 202, Omaha, Nebr.
3634 Grand Central Term., New York, N.Y.
1836 Euclid Ave., Cleveland, Ohio
765 S. Riverside Dr., Tulsa, Okla.
1505 Race St., Philadelphia, Pa.
Ft. Pitt Hotel, Rm. 701, Pittsburgh, Pa.
136 Casa Linda Plaza, Dallas, Tex.
2425 W. Holcombe, Houston, Tex.
1515 N. Courthouse Rd., Arlington, Va.
1138 Poplar Place, Seattle, Wash.
745 N. Fourth St., Milwaukee, Wis.
MANUFACTURERS' REPRESENTATIVES:
Sales Engineers, Co., 211-212 Wazee St., Denver, Colo.
Koeln, G. R., & Co., 144 Walker St., S.W., Atlanta, Ga.
Redmann, S. M., 2322 Valmont St., New Orleans, La.
Black, R. B., 4716 Trumbull, S.E., Albuquerque, N.M.
Daw, W. E., Co., 753 James St., Syracuse, N.Y.

Pyrene-C-O-Two Div. 233
The Fyr-Fyter Co.
P. O. Box 750, Newark, N. J.
BRANCH OFFICES:
132-40 Hawthorne St., San Francisco, Calif.
1329 Spring St., Northwest, Atlanta, Ga.
2750 W. 35th St., Chicago, Ill.
3917 Main St., Dallas, Texas

—Q—

Quabaug Rubber Co. 163
N. Brookfield, Mass.

Quickee Products, Inc.
141 Woodworth Ave., Yonkers, N. Y.

—R—

Racine Glove Company, Inc.
Box 38, Rio, Wis.

Randolph Industrial Equip. Co.
9559 W. Grand Ave., Frank. Pk., Ill.

Randolph Laboratories, Inc. 246
8 E. Kinzie, Chicago, Ill.

Raybestos-Manhattan, Inc.
Asbestos Textile Div., Manheim, Pa.
FACTORIES:
Bridgeport, Conn.
Crawfordsville, Ind.
Passaic, N.J.
Manheim, Pa.
No. Charleston, S.C.
Neenah, Wis.
Peterborough, Ont., Can.

Raymond Corp., The
179 Madison St., Greene, N. Y.

Ready Made Sign Co., Inc. 273
115 Worth St., New York, N. Y.

Record Industrial Co. 159
3301 Arch St., Philadelphia 4, Pa.
BRANCH OFFICES:
29 Ballard Dr., West Hartford, Conn.
914 Healey Bldg., Atlanta, Ga.
110 Sunrise Terrace, Cedar Grove, N.J.

Red Comet Incorporated
Red Comet Building, Littleton, Colo.

Reece Wooden Sole Shoe Co. 182, 264
13th & 41st Ave., Columbus, Nebr.

Reed-Curtis Nuclear Industries, Inc.
307 Culver Blvd., Playa Del Rey, Calif.

Reliance Steel Products Co.
3800 Walnut St., McKeesport, Pa.

Robbins & Myers, Inc.
1345 Lagounda Ave., Springfield, Ohio
BRANCH OFFICES:
1829 N. Harlem Ave., Chicago, Ill.
Rm. 361, Union Sta., Kansas City, Mo.
57 Murray St., New York, N.Y.
221 Leader Bldg., Cleveland, Ohio
DISTRIBUTORS:
Brownlee-Morrow Engr., 745 N. 44th St., Birmingham, Ala.
Ferndoltz Machinery Co., 8468 Melrose Pl., Los Angeles, Calif.
Boswell, C. W., 1139 Mission St., San Francisco, Calif.
Hahn Equip. Co., 1795 Sheridan Blvd., Denver, Colo.
Koch, Ed., 1840 Hilton Rd., Ferndale, Mich.
Sherman, M. B., 1341 S. Boston St., Tulsa, Okla.
Jones, Tom B., 651 S. Cooper, Memphis, Tenn.
Haley, G. R., 4801 Lemmon Ave., Dallas, Tex.
Boswell, R. E., 2027 Harold St., Houston, Tex.

Rochester Safety Equipment Co. 226
83 Howell St., Rochester 7, N. Y.

Rockwood Sprinkler Co. 234-235
72 Harlow St., Worcester 5, Mass.
BRANCH OFFICES:
Los Angeles, Calif.
Chicago, Ill.
Boston, Mass.
Grand Rapids, Mich.
St. Louis, Mo.
Buffalo, N.Y.
New York, N.Y.
Cleveland, Ohio
Pittsburgh, Pa.
Montreal, P. Q., Canada

Rolas Products Corp.
69-73 Summit Street, Newark 4, N. J.

Rol-Away Truck Mfg. Co., Inc.
6143 S. E. Foster, Portland 6, Ore.
DISTRIBUTORS:
Commercial Equip. Co., 201 Garrison Ave., Ft. Smith, Ark.
Harshbarger, Glenn A., Co., 5123 York Blvd., Los Angeles, Calif.
Robco, Inc., 5519 Jillson St., Los Angeles, Calif.
Kinney, James P., Co., 5141 Telegraph Rd., Los Angeles, Calif.
Colson Equip. & Supply Co., 1317 Willow St., Los Angeles, Calif.
McKinley Equip. Corp., 1557 Esperanza St., Los Angeles, Calif.
Modern Mat. Hdly. Equip. Co., 1738 Griffin Ave., Los Angeles, Calif.
Green-Penny Co., 421 E. Washington, Los Angeles, Calif.
Green-Penny Co., 2211 San Pablo Ave., Oakland, Calif.
Goodale, C. S., Co., 3694 Kettner Blvd., San Diego, Calif.
O'Donnell, F. F., Co., 2298 Jerrold Ave., San Francisco, Calif.
Norcal Storage Equip., 629 Fulton St., San Francisco, Calif.
Hamerslag Equip. Co., 110 Freeway Blvd., South San Francisco, Calif.
Whiting, J. D., P.O. Box 3382, Denver, Colo.
Armstrong Caster Co., 465 Santa Fe Dr., Denver, Colo.
Ratliboun, L. G., Co., 1414 Sixteenth St., Denver, Colo.
Holo-Hansen, O., 110 Rock Major Rd., Tanaka Park, Fairfield, Conn.
Caseley Corp., P.O. Box 1858, Hartford, Conn.
Hughes, John, Co., 6119 Chillum Pl., NE, Washington, D.C.
Electronic Whlsalers, Inc., 2345 Sherman Ave., NW, Washington, D.C.
Stiles Con. & Trans., 596 N. W. 54th St., Miami, Fla.
Southeastern Handling Equip. Co., Inc., 420 Luckie Ave., NW, Atlanta, Ga.
Cooke, Martin, Stone Acres, Stone Mountain, Ga.
Parkinson Tractor Co., P.O. Box 578, Idaho Falls, Idaho
McMaster-Carr Supply, 640 W. Lake St., Chicago, Ill.
Sommer & Maca Glass Machinery Co., 3600 S. Oakley Ave., Chicago, Ill.
Don, Edward, & Co., 2201 S. LaSalle, Chicago, Ill.
Ramrod Chemical Co., 549 W. Randolph St., Chicago, Ill.
Illinois Equip. Serv. Inc., 338 N. Lorel Ave., Chicago, Ill.
Electric Supply Co., 701 Jackson Blvd., Chicago, Ill.
McMeekin Equip. Co., 5643 W. Division St., Chicago, Ill.
American Hospital Supply, 2020 Ridge Ave., Evanston, Ill.
Jackson, C., Co., Inc., 228-232 E. 147th, Harvey, Ill.
Material Handling Engrs., 820 N. Ridgeland Ave., Oak Park, Ill.
Ken-Dick Corp., 1712—15th St. Place, Moline, Ill.
Modern Equip. Co., 1140 College Ave., Indianapolis, Ind.
National China & Equip., 214 E. Fourth St., Marion, Ind.
Blankenbaker, O., 1848 Broadway, Ft. Wayne, Ind.
Knapp, Arthur L., Co., P.O. Box 154, South Bend, Ind.
Iowa Machinery & Supply, 315-317 Court Ave., Des Moines, Iowa
Louisiana Warehouse & Distributing Co., 601-603 Garfield St., Lafayette, La.
Yarrington & Johns, Inc., 320-324 W. 24th St., Baltimore, Md.
Pyramid Engr. Co., 709 Murdock Rd., Baltimore, Md.
Elmer & Co., 155 W. Lafayette Ave., Baltimore, Md.
Colson-Merriam Co., 1623 Aisquith St., Baltimore, Md.
Kinney, Robert L., P.O. Box 664, Silver Spring, Md.
American Scale & Conv., 365-371 Neponset Ave., Dorchester, Mass.
Power Products Co., Inc., 11 Claflin St., Framingham, Mass.
Stanly Handling Equip. Co., P.O. Box 252, Springfield, Mass.
Hutzler Sales Co., 94 State St., Springfield, Mass.
McGowan, J. Ford, 114 Worthen Ave., Weymouth, Mass.
R & R Plumbing Supply Co., 135 Union St., Worcester, Mass.
Rapheon Equip. Co., 25167 Grand River at 7 Mile Rd., Detroit, Mich.
Crissman, Glenn P., Co., 679 W. Baltimore Ave., Detroit, Mich.
Brown-Darnell Co., 12701 Capital Ave., Oak Park, Mich.
Able Engr. Inc., 607—22nd Ave., NE, Minneapolis, Minn.

Please mention National Safety News when contacting any of these organizations.

Bathke, F. H., Co., 519 N. Cleveland Ave., St. Paul, Minn.
Industrial Power Equip., 1735 Charolette St., Kansas City, Mo.
Connell, John J., Co., Inc., 3014 Olive St., St. Louis, Mo.
Midvale Material Hdly. Equip., 5011 Manchester Ave., St. Louis, Mo.
Rumpf, Guy H., Mach. & Equip., Railway Ex. Bldg., St. Louis, Mo.
Thompson, Owen E., 5005 Jamieson Ave., St. Louis, Mo.
Christy Equip. Co., 2056 Farnam St., Omaha, Neb.
Heald, Prescott, and Son, 1114 Jackson St., Omaha, Neb.
Snell Sales Co., 60 Squanto Rd., Quincy, N.H.
Samson Equip. Co., 38 Rollins Ave., Clifton, N.J.
American Service Co., 519 Main St., East Orange, N.J.
ABCO Sales Co., 345 Market St., Kenilworth, N.J.
Reliance Equip. Co., 65 McWhorter St., Newark, N.J.
Newark Ladder & Bracket, 584 Springfield Ave., Newark, N.J.
Adair, Robin W., Co., Inc., Avoca, N.Y.
Novak, Harry B., 309 New York Ave., Brooklyn, N.Y.
Standard Equip. Co., 3175 Fulton St., Brooklyn, N.Y.
Lanich-Schreiner Co., Inc., 84 Pearl St., Buffalo, N.Y.
Liss, A., & Co., 747—6th Ave., New York, N.Y.
Grantruck & Caster, 324 Bryant Ave., New York, N.Y.
Jules Dierck Distr. Co., 70 Duane St., New York, N.Y.
Nat'l Hosp. Supply Co., 145 Nassau St., New York, N.Y.
Sanco Equip. Co., 24 E. 12th St., New York, N.Y.
Coleman, J. E., Co., 50 E. 42nd St., New York, N.Y.
Lambright, H. T., Corp., P.O. Box 538, Rochester, N.Y.
Schenectady Materials Handling Co., P.O. Box 605, Schenectady, N.Y.
Cooper, Charles R., 335 Kensington Rd., Syracuse, N.Y.
Gerhardt, G. J., P.O. Box 381, Troy, N.Y.
French Mill Supply Co., 133 N. Genesee St., Utica, N.Y.
McDonald, W. L., P.O. Box 2107, Greensboro, N.C.
Werner, E. J., Co., 343 W. Exchange St., Akron, Ohio
Diamond, Ken, Co., 3455 Edwards Rd., Cincinnati, Ohio
Duncan, Paul A., Inc., 2375 Noble Rd., Cleveland, Ohio
Slife, Robert M., & Assoc., 3744 Prospect Ave., Cleveland, Ohio
Equipment for Industry, 7512 Carnegie Ave., Cleveland, Ohio
Ohio Equip. Co., Inc., 1658 St. Clair Ave., NE, Cleveland, Ohio
Atlas Material Co., 3049 Woodland Ave., Cleveland, Ohio
Col-Mer Co., The, 949 W. Third Ave., Columbus, Ohio
Sherry, Edward J., Co., 181 East Fifth Ave., Columbus, Ohio
Condit, R. E., Co., 10 State St., Dayton, Ohio
Taylor, Harold G., Co., 4023 Upton Ave., Toledo, Ohio
Fournier, Edw. G., Co., P.O. Box 2505, Youngstown, Ohio
Henk, E. J., Son, 2 Crailo Ave., Pittsburgh, Pa.
Unistrut Pittsburgh Ser. Co., 1280 Ridge Ave., Pittsburgh, Pa.
Fuller, J. R., Co., 7033 Kelly St., Pittsburgh, Pa.
J. R. Supply Co., 3435 Babcock Blvd., Pittsburgh, Pa.
Stokes Equip. Co., 11 W. Mt. Airy Ave., Philadelphia, Pa.
Hill, Fred, & Son, 10th & Cherry Sts., Philadelphia, Pa.
A-1 Industrial Equip., 1202-22 Frankford Ave., Philadelphia, Pa.
Clark Mat. Hdly. Co., 122 S. Cameron St., Harrisburg, Pa.
Dozier Equip. Co., 1530 Demonbreun St., Nashville, Tenn.
Dreaden, W. M., Co., Inc., 418 Second Ave., So., Nashville, Tenn.
Dodson Chemical Co., 1022 W. Fifth St., Amarillo, Tex.
Unistrut-Texas Service, 3009 Canton St., Dallas, Tex.
Collier, C. H., Co., P.O. Box 6118, Dallas, Tex.
Sinclair Sales Co., Inc., Number 1 Main St., Houston, Tex.
Bell, Charles T., & Co., 4101 San Jacinto, Houston, Tex.
Zehner, Chas. F., & Assn., P.O. Box 2777, San Antonio, Tex.
Equip. Supply Co., 16 Post Office Place, Salt Lake City, Utah
Clarke, C. E., & Son, 1313 Altamont Ave., Richmond, Va.
Air Mac, Inc. of Washington, 3838 Fourth Ave. So., Seattle, Wash.
McElhaney, H. L., Co., 425 Alaskan Way So., Seattle, Wash.
Burleigh, G. E., Co., 5245 Pullman Ave., Seattle, Wash.
McKown Sales Co., 713 Fifth Ave., Huntington, W. Va.
Jefferds & Moore, P.O. Box 4295, Charleston, W. Va.
Salentine Equip. Co., 314 E. Juneau Ave., Milwaukee, Wis.
Brown, W. H., 3407 W. Juneau, Milwaukee, Wis.
C & H Electric Machine Co., 436 W. Juneau Ave., Milwaukee, Wis.
Artz, E. G., Inc., 1929 W. Clybourn St., Milwaukee, Wis.
Flagstad, M. J., 629 S. Jefferson St., Green Bay, Wis.
Gilbert Surgical Co., 460 Bloor St. W., Toronto, Ont., Can.
Grand & Toy Limited, 6-14 Wellington St. W., Toronto, Ont., Can.
Youngblud, W. A., Co., 177 King William St., Hamilton, Ont., Can.
Ryder, J. H., Mach. Co., 8455 Decarie Blvd., Montreal, Que., Can.
Johnston, G. N., Equip. Co., 1179 Decarie Blvd., Montreal, Que., Can.
Hughes, Francis, & Assoc., 4850 Amiens St., Montreal North, P.Q., Can.

Rose Mfg. Co. **50**
2700 W. Barberry Pl., Denver, Colo.
DISTRIBUTORS:
Harless, L. P., Co., 2627 Seventh Ave., S., Birmingham, Ala.
Bullard, E. D., Co., 6719 S. Figueroa, Los Angeles, Calif.
Bullard, E. D., Co., 2680 Bridgeway, Sausalito, Calif.
Safety Equip. Co., 1630 17th St., Denver, Colo.
Union Supply Co., Inc., 5490 Colorado Blvd., Denver, Colo.
Protective Equip., Inc., 634 Orleans St., Chicago, Ill.
Universal Safety Equip. Co., 5115 Diversey Ave., Chicago, Ill.
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Guardian Safety Equip. Co., 3615 Capitol Heights Ave., Baton Rouge, La.
General Equip. Corp., 261 Franklin St., Boston, Mass.
Boyer-Campbell Co., The, 6540 St. Antoine St., Detroit, Mich.
Continental Safety Equip., Inc., 1551 Selby Ave., St. Paul, Minn.
Safety, Inc., 17 E. 31st St., Kansas City, Mo.
Safety, Inc., 2608 Olive St., St. Louis, Mo.
Big Horn Supply, Inc., P.O. Box 2036, Billings, Mont.
Guardian Safety Equip. Co., 400 So. Jefferson St., Orange, N.J.
Notte Safety Appliances Co., 308 Main St., East Orange, N.J.
Adair, Robin W., Co., Avoca, N.Y.
American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.
Acme Safety Prod. Co., 387 Storer Ave., Akron, Ohio
Guardian Safety Equip. Co., 1742 S. Main St., Tulsa, Okla.
Sanderson Safety Supply Co., 816 S.E. Hawthorne Blvd., Portland, Ore.
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Industrial Prod. Co., 2820 N. 4th St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Safety Equip. Dist. Co., 832 W. Main Ave., Knoxville, Tenn.
Guardian Safety Equip. Co., 900 Jefferson Tower, Dallas, Tex.
Guardian Safety Equip. Co., 1915 Westheimer, Houston, Tex.
Universal Safety & Fire Equip. Co., P.O. Box 1587, Salt Lake City, Utah
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Industrial Safety Supply Co., 5518 MacCorkle Ave., S.E., Charleston, W. Va.
Protective Equip. Inc., 2001 W. Capitol Dr., Milwaukee, Wis.
Universal Safety Equip. Co., 3155 So. 7th, Milwaukee, Wis.

Ruemelin Mfg. Co. **74**
3860 N. Palmer St., Milwaukee, Wis.

—S—

Safeguard Mfg. Co.
Transylvania Rd., Woodbury, Conn.

Safe-Lad Mfg. Co.
1001 S. E. Morrison St., Portland, Ore.
DISTRIBUTORS:
Vulcan Service Co. Inc., 1153 Laurel St., San Carlos, Calif.
Loge, J. M., 2171 W. Washington Blvd., Los Angeles, Calif.
Freedman, S., & Sons, Inc., 618 K St., N.W., Washington, D.C.
Bockstanz Brothers Co., 1295 Beaufait Ave., Detroit, Mich.
Gast, P. B., & Sons Co., 1515 Madison Ave., S.E., Grand Rapids, Mich.
Quie Brush Co., 1422 McGee St., Kansas City, Mo.
Navy Brand Mfg. Co., 2025 Washington Ave., St. Louis, Mo.
Industrial Chem. Labs. Inc., 1015 N. 14th St., Omaha, Neb.
State Chem. Mfg. Co., 2435-39 Superior Ave., Cleveland, Ohio
Hoffman, F. W., & Co., Inc., 25-37 S. Fourth, Philadelphia, Pa.
Dow, Neil, 418 N. 60th St., Seattle, Wash.
Shulkin, Mike, 4912 N. Cook St., Spokane, Wash.
Gilinsky, Maurice, 1506 E. Kensington Blvd., Milwaukee, Wis.

Safety Box Toe Co. **146-147**
812 Statler Office Bldg., Boston 16, Mass.

Safety Clothing & Equipment Co. **182**
1990 E. 69th St., Cleveland 3, Ohio

Safety Ear Protector Co. **88**
2622 S. Robertson Blvd., Los Angeles, Calif.

Safety First Products Corp.
175 Saw Mill River Rd., Elmsford, N. Y.

Safety First Shoe Co.
Water Street, Holliston, Mass.

Safety First Supply Co. **224**
425 Magee St., Pittsburgh 19, Pa.
BRANCH OFFICES and DISTRIBUTORS:
4251 W. 35th St., Cleveland, Ohio
P.O. Box 226, Toledo, Ohio
1594 Jackson St., Charleston, W. Va.
1 Garland Ave., Wheeling, W. Va.

Safety Floor Products **254**
3038 W. 84th Place, Chicago, Ill.
DISTRIBUTORS:
Guardian Safety Equip. Co., 7223 So. Main St., Los Angeles, Calif.
Guardian Safety Equip. Co., 3615 Capital Heights, Baton Rouge, La.
Boyer-Campbell Co., 6540 St. Antoine St., Detroit, Mich.
Boyer-Campbell Co., 301 Indiana Ave. N.W., Grand Rapids, Mich.
Safety Inc., 17 E. 31st St., Kansas City, Mo.
Safety Inc., 2608 Olive St., St. Louis, Mo.
Wilson, W. S., Corp., 47—38th St., Long Island City, N.Y.
Safety First Supply Co., 3663 Shanabruch N.W., Canton, Ohio
Safety First Supply Co., 4251 W. 35th St., Cleveland, Ohio
Safety First Supply Co., 858 W. Delaware Ave., Toledo, Ohio
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Guardian Safety Equip. Co., 1915 Westheimer, Houston, Tex.
Spokane Safety Appliance Co., N. 219 Division St., Spokane, Wash.
Safety First Supply Co., 1594 Jackson St., Charleston, W. Va.
Pagel Safety Products, 4611 W. National Ave., Milwaukee, Wis.
Levitt-Safety Ltd., 747 Vaughan Rd., Toronto, Ontario, Can.

Safety Lifeline Lock Co.
P. O. Box 1233, Burbank, Calif.

Safety Tower Ladder Co. **43**
P. O. Box 1052, Burbank, Calif.
DISTRIBUTOR:
Eberts, Dunbar A., 7 East 48th St., New York, N.Y.

Safway Steel Products, Inc.
6228 W. State St., Milwaukee 13, Wis.
BRANCH OFFICES:
Safway Steel Scaffolds Co., 5875 Rodeo Road, Los Angeles, Calif.
Chicago Safway Scaffolds, 1634 W. North Ave., Chicago, Ill.
Safway Steel Scaffolds, Minn. Div., 3130 Talmadge Ave., S.E., Minneapolis, Minn.
Safway Steel Scaffolds Supply Corp., 42-39 Tenth St., Long Island City, N.Y.
Milwaukee Rental & Sales Div., 1175 N. 62nd St., Milwaukee, Wis.
DISTRIBUTORS:
Allis-Lee Equip. Co., 1133 Speer Blvd., Denver, Colo.
McGhan Scaffolding Co., 1515 11th St., N.W., Washington, D.C.
Safway Steel Scaffolds Co., 570 Forrest Road, N.E., Atlanta, Ga.
Churchman, M. S., Inc., 1107 Burdsal Parkway, Indianapolis, Ind.
Safway Steel Scaffolds Co., 1604 E. 4th St., Sioux City, Iowa
Crabbs, Austin, Inc., P.O. Box 816, Davenport, Iowa
Jahncke Service, Inc., 814 Howard Ave., New Orleans, La.
Marr Scaffolding Co., 25-27 D St., South Boston, Mass.
Safway Steel Scaffolds, Inc., 57 E. Canfield Ave., Detroit, Mich.
Safway Steel Scaffolds Co. of St. Louis, Inc., 529 N. Beaumont St., St. Louis, Mo.
Safway Rental & Sales Co., 1600 Baltimore Ave., Kansas City, Mo.
Rental Equip. Co., 4015 First Ave., S., Billings, Mont.
Blizt-Johnson, Inc., 717 Spencer St., Syracuse, N.Y.
Dillon Supply Co., 216 S. West St., Raleigh, N.C.
Contractor's Service, Inc., 317 W. Worthington, Charlotte, N.C.
Safway Steel Scaffolds Co., 253 Bourse Bldg., Philadelphia, Pa.
Safway Steel Scaffolds Co. of Pittsburgh, Commonwealth Bldg., 312 Fourth Ave., Pittsburgh, Pa.
Southeastern, Inc., 917 Cooper St., Knoxville, Tenn.

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Choctaw, Inc., P.O. Box 2057, Memphis, Tenn.
Safway Scaffolds Co. of Texas, Inc., 7129 Harry Hines Blvd., Dallas, Tex.
Safway Steel Scaffolds of Virginia, 1725 Rhoadmiller St., Richmond, Va.
Safway Steel Scaffolds Co. of Madison, 940 Williamson St., Madison, Wis.

LICENSEE MANUFACTURERS:
Beatty Safway Scaffold, Inc., Tunnel Ave. & Beatty Rd., San Francisco, Calif.
Sarnia Bridge Co., Ltd., Sarnia, Ont., Can.

Salisbury, W. H., & Co. 166
401 N. Morgan St., Chicago, Ill.

Sani-Mist, Inc.
1724 Chestnut St., Philadelphia, Pa.

DISTRIBUTORS:
Lincoln Chemical Co., 3650 Broderick St., San Francisco, Calif.
Waico Products Co., 4564 Penn Ave., Pittsburgh, Pa.
Sani-Mist Southwest, P.O. Box 7232, Dallas, Tex.

Sargent-Sewell
P. O. Box 1176, Grand Prairie, Texas

Sarole, Inc.
228 N. Wood Ave., Linden, N. J.

Sawyer, H. M., & Son, Co.
20 Thorndike St., Cambridge 41, Mass.

BRANCH OFFICES:
620 Gibbons St., Los Angeles, Calif.
72 Kissling St., San Francisco, Calif.
117 Madison St., Seattle, Wash.

DISTRIBUTORS:
Moore-Handley Hardware Co., Inc., 27 S. 20th St., Birmingham, Ala.
Moore-Handley Hardware Co., Inc., 401 N. Water St., Mobile, Ala.
Lyons Machinery Co., 904 Broadway, Little Rock, Ark.
Barnes & Delaney, Atlantic & Willow Sts., Long Beach, Calif.
Bullard, E. D., Co., 6719 S. Figueroa St., Los Angeles, Calif.
Dickson Safety Prod. Co., 2952 Crenshaw Blvd., Los Angeles, Calif.
Guardian Safety Equip. Co., 7223 S. Main St., Los Angeles, Calif.
Cake, Geo. F., Co., 1774 Shattuck Ave., Berkeley, Calif.
Aeroweld, Inc., 3955 Pacific Hwy., San Diego, Calif.
Brenton Equip. Co., 374 Brannan St., San Francisco, Calif.
Bullard, E. D., Co., 275 Eighth St., San Francisco, Calif.
Darvold Co. of Calif., 234 9th St., San Francisco, Calif.
Guardian Safety Equip. Co., 50 Hawthorne St., San Francisco, Calif.
McDonald, B. F., Co., 1255 Howard St., San Francisco, Calif.
Union Supply Co., 5460 N. Colorado Blvd., Denver, Colo.
Bidwell Rubber Co., 1297 Main St., Hartford, Conn.
Industrial Safety Supply Co., Inc., 574 New Park Ave., W. Hartford, Conn.
Abern Safety Equip. Corp., 2 Eld St., New Haven, Conn.
Briggs Rubber Prod. Co., 3000 Lancaster Ave., Wilmington, Del.
Cameron & Barkley Co., The, 605 E. Forsyth, Jacksonville, Fla.
Miller Machy. & Supply Co., 601 Church St., Jacksonville, Fla.
Cameron & Barkley Co., The, 727 N.W. First Ave., Miami, Fla.
Miller Machy. & Supply Co., 127 N.E. 27th St., Miami, Fla.
Cameron & Barkley Co., The, Orlando, Fla.
Lou, Harry P., Inc., 100 Livingston Ave., Orlando, Fla.
Panama Machy. & Supply Co., P.O. Box 850, Panama City, Fla.
Cameron & Barkley Co., The, 107 S. Franklin, Tampa, Fla.
Guardian Safety Equip. Co., 427½ Moreland Ave., N.E., Atlanta, Ga.
Toll, J. M., Metal & Supply Co., Inc., 285 Marietta St., N.W., Atlanta, Ga.
Richmond Supply Co., 652 7th St., Augusta, Ga.
Farmer, C. W., Co., 515 5th St., Macon, Ga.
Cameron & Barkley Co., The, 12 N. Water St., Savannah, Ga.
Georgia Supply Co., P.O. Box 918, Savannah, Ga.
Universal Safety Equip. Co., 5115 W. Diversey Ave., Chicago, Ill.
O'Neill Rubber Co., 215 W. Ohio St., Chicago, Ill.
Midwest Fire & Safety Equip. Co., Inc., 1605 Prospect St., Indianapolis, Ind.
Mid-Continent Transmission & Supply, Inc., 2027 N. Broadway, Wichita, Kan.
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Brown-Roberts Hardware & Supply Co., Ltd., Alexandria, La.
Lake Charles Pipe & Supply, 1328 Broad St., Lake Charles, La.
Weaks Supply Co. Ltd., P.O. Drawer 1572, Monroe, La.
Harold, C. V., Rubber Co., 115 Chartres St., New Orleans, La.
Woodward, Wight & Co., Ltd., 451 Howard Ave., New Orleans, La.
Superior Iron Works & Supply Co., Inc., 1202 Marshall St., Shreveport, La.
Sargent, Lord & Co., 42 Portland Pier, Portland, Me.
Briggs Rubber Prod. Co., 3562 S. Hanover St., Baltimore, Md.
General Supply & Equip. Co., 530 E. 25th St., Baltimore, Md.
Robins Rubber Div., A. K., Robins Co., 234 Key Hwy., Baltimore, Md.
Donohue, James O., Co., 100 Maryland Ave., Towson, Md.
Boston Beltine & Rubber Corp., 146 Oliver St., Boston, Mass.
Moore, Irving B., Corp., 65 High St., Boston, Mass.
Greene Rubber Co., Broadway at 6th St., Cambridge, Mass.
Haverhill Rubber Co., 113 Merrimack St., Haverhill, Mass.
Dahill Co., The, 1886 Purchase St., New Bedford, Mass.
Chase Safety Service, Inc., 7 Chase Terrace, Shrewsbury, Mass.
Boyer-Campbell Co., The, 6540 St. Antoine St., Detroit, Mich.
Continental Rubber Works, 13801 Schoolcraft Ave., Detroit, Mich.
Ohio Rubber Supply Co., 59 Seiden Ave., Detroit, Mich.
Central Supply Co., 1309 Fulton St., E., Grand Rapids, Mich.
Mars, W. P. & R. S., Co., 322 W. Michigan St., Duluth, Minn.
Elvin First Aid Supply Co., 327 2nd Ave., N., Minneapolis, Minn.
Continental Safety Equip. Co., 1551 Selby Ave., St. Paul, Minn.
Dilworth, J. E., Co., 305 S. State St., Jackson, Miss.
Zink Safety Equip. Co., 700 W. 12th St., Kansas City, Mo.
Safety, Inc., 2610 Olive St., St. Louis, Mo.
Zink Safety Equip. Co., 1110 S. Brentwood St., St. Louis, Mo.
Alger Industrial Specialties, 5102 N. 50th St., Omaha, Neb.
Hawkins, Richard O., Co., Wolfeboro, N.H.
Universal Fire Equipment Corp., 45 S. 16th St., East Orange, N.J.
Safeguard Industrial Equip. Co., 271 Verona Ave., Newark, N.J.
Adair, Robin W., Co., Box 248, Avoca, N.Y.
Gebler Supply Co., P.O. Box 739, Binghamton, N.Y.
American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.
Elwood Corp., The, 2189 Elmwood Ave. at Hinman, Buffalo, N.Y.
Karr, Geo., Co., 60 Stone St., New York, N.Y.
Pearson Bros., Inc., 53 Murray St., New York, N.Y.
Chamberlin Rubber Co., 186 N. Clinton Ave., Rochester, N.Y.
American Allsafe Co., Inc., 2704 Erie Blvd., E., Syracuse, N.Y.
Tidewater Supply Co., Inc., 95 Roberts St., Asheville, N.C.
Contractors Service, Inc., 317 W. Worthington Ave., Charlotte, N.C.
Mill-Power Supply Co., 422 S. Church St., Charlotte, N.C.
Walke, Henry, Co., The, 1310 S. Tryon St., Charlotte, N.C.
Dillon Supply Co., 112 S. Duke St., Durham, N.C.
Dillon Supply Co., 1035 N. William St., Goldsboro, N.C.
Rubber Products Co., Inc., 3903 E. Bessemer Ave., Greensboro, N.C.
Smith-Courtney Co., 241 S. Davie St., Greensboro, N.C.
Smith-Courtney Co., Inc., 103 Third St., S.W., Hickory, N.C.
Hardware Bldrs. Supply Co., Morehead City, N.C.
East Carolina Supply Co., Inc., Highway 64, E., Plymouth, N.C.
Dillon Supply Co., 216 S. West St., Raleigh, N.C.
Dillon Supply Co., 348 S. Washington St., Rocky Mount, N.C.
Mill & Contr. Supply Co., 121 Water St., Wilmington, N.C.
Acme Safety Products Co., 307 Storer Ave., Akron, Ohio
Heimerichs Supply Co., 2201 Taylor Road at Nela View, Cleveland, Ohio
Midwestern Rubber Co., 1900 Lakeside Ave., N.E., Cleveland, Ohio
Safety Clothing & Equip. Co., 1999 E. 69th St., Cleveland, Ohio
Dayton Safety Supply Co., 216 Longworth St., Dayton, Ohio
Reliable Rubber Prod. Co., 913 Wayne Ave., Dayton, Ohio
Elyria Rubber & Supply Co., 256 George St., Elyria, Ohio
Ohio Valley Safety Apparel Co., The, 523 N. Commercial St., Steubenville, Ohio
Acme Safety Prod. Co., 1823 Vermont St., Toledo, Ohio
Youngstown Rubber Prod. Co., The, 615 Market St., Youngstown, Ohio
Cotton, C. W., Supply Co., Natl. Bank of Tulsa Bldg., Tulsa, Okla.
Guardian Safety Equip. Co., 1742 S. Main St., Tulsa, Okla.
Cal-Ore Machy. Co., 944 S. Central, Medford, Ore.
Sanderson Safety Supply Co., 816 S.E. Hawthorne Blvd., Portland, Ore.
Brooks, Earl A., U.S. Rt. 30, Coatesville, Pa.
Bretz, S. S., 62 N. Dawes St., Kingston, Pa.
Bertram Rubber Co., Lancaster, Pa.
Briggs Rubber Prod. Co., 136 Chestnut St., Philadelphia, Pa.
General Scientific Equip. Co., 27th & Huntingdon Sts., Philadelphia, Pa.
Greene Mfg. Co., 14 S. 39th St., Phila., Pa.
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Sibley Hose & Rubber Co. 2443 W. Huntingdon St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Shields Rubber Co., 137 Fort Pitt Blvd., Pittsburgh, Pa.
B & M Supply Co., 1010 Park Ave., Cranston, R.I.
Cameron & Barkley Co., The, 160 Meeting St., Charleston, S.C.
Thackston-Davis Supply Co., 828 Gervais St., Columbia, S.C.
Tidewater Supply Co., Inc., 807-811 Gervais St., Columbia, S.C.
Montgomery & Crawford Co., Inc., P.O. Box 1597, Spartanburg, S.C.
Montague, B. L., Co., Inc., E. Liberty St., Sumter, S.C.
Sioux Falls Paper Co., Sioux Falls, S.D.
Genter, C. D., Co., 21-9-15 Broad St., Chattanooga, Tenn.
Southern Products Co., Inc., 1005 Chestnut St., Chattanooga, Tenn.
Tidewater Supply Co., Inc., 1506 Island Home Ave., Knoxville, Tenn.
Clement Safety Equip., Inc., 720 S. 3rd St., Memphis, Tenn.
Continental Rubber Works, 268 Madison Ave., Memphis, Tenn.
Orgill Bros. & Co., 10 W. Calhoun Ave., Memphis, Tenn.
Moore-Handley Hardware Co., Inc., 492 Craighead St., Nashville, Tenn.
Radcliffe Supply Co., 314 E. 5th St., Amarillo, Tex.
Engineering Supply Co., 6000 Denton Drive, Dallas, Tex.
McDaniel Distributing Co., 5809 Clinton Drive, Houston, Tex.
McDonald, B. F., Co., 3745 Greenbriar Drive, Houston, Tex.
Mountain States Rubber Co., Inc., 131 Social Hall Ave., Salt Lake City, Utah
Universal Safety & Fire Equip., 727 S.W. Temple St., Salt Lake City, Utah
Montague Rubber Co., 116 Randolph St., Norfolk, Va.
Richmond Rubber Co., 7th & Leigh Sts., Richmond, Va.
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Industrial Safety Supply Co., 5518 MacCorkle Ave., S.E., Charleston, W.Va.
Conney Products Co., 174 W. Division St., Fond Du Lac, Wis.
Vorpahl, W. A., Co., 1049 Langlade Ave., Green Bay, Wis.
Kuehn, N. L., Co., 1053 N. Fourth St., Milwaukee, Wis.
Protexall Apron Co., P.O. Box 162, Ripon, Wis.
Union Supply Co., 208 N. Market St., Casper, Wyo.
Hawaiian Gas Prod., Ltd., P.O. Box 2454, Honolulu, T.H.
Gaspro, Ltd., P.O. Box 2454, Honolulu, T.H.

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139 S. Main St., Port Chester, N. Y.
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Cosa Corp., c/o Hicks Mach. Inc., Box 715, Walpole, N.H.
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Cosa Corp., Chrysler Bldg., 405 Lexington Ave., New York City, N.Y.
Cosa Corp., Long Island City, Long Island, N.Y.
Cosa Corp., Cleveland, Ohio
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Marshall Supply & Equip. Co., Oklahoma City, Okla.
Marshall Supply & Equip. Co., Tulsa, Okla.
Rapp, Wm., 133 N. 3rd St., Philadelphia, Pa.
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Stametz, Wm. K., Co., Jenkins Arcade Bldg., Pittsburgh, Pa.

Schneible, Claude B., Co.
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470 Vanderbilt Ave., Brooklyn 17, N. Y.

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Scott Aviation Corp. 174
211 Erie St., Lancaster, N. Y.

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Welders Supply Co., 608 Thomas St., Little Rock, Ark.
Western Fire Equip. Co., 69 Main St., San Francisco, Calif.

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Bullard, E. D., Co., 6719 S. Figueroa, Los Angeles, Calif.
Curtis, L. N., & Sons, 5808 College Ave., Oakland, Calif.
Dickson Safety Products, 2952 Crenshaw Blvd., Los Angeles, Calif.
Halprin Supply Co., 1355 S. Flower St., Los Angeles, Calif.
Seagrave-Hirsch Co., 2859 E. 50th St., Los Angeles, Calif.
MacGalley Fire Fighting Equip., 1163 Steele, Denver, Colo.
Pueblo Fire Equip. Co., 1414 W. 4th St., Pueblo, Colo.
Safety Equip. Co., 1630 17th St., Denver, Colo.
Industrial Safety Supply, 474 New Park Ave., W. Hartford, Conn.
Maxwell, O. B., Co., 62 Bagley Ave., Hamden, Conn.
Capitol Fire Equip. Co., 205 W. Division, Dover, Del.
Southern Oxygen Co., P.O. Box 5087 (Domestic Div.), Washington, D. C.
Southeastern Safety Appl., 1610 Crescent Ave., N.E., Atlanta, Ga.
Protective Equip. Co., 634 N. Orleans St., Chicago, Ill.
Brown, S. G., Fire Equip., 461 W. Park Ave., Aurora, Ill.
Safety Equip. & Supply Co., 1724 W. Main St., Fort Wayne, Ind.
Indiana Fire Prevention Co., 545 S. East St., Indianapolis, Ind.
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Mid-Continent Transmission & Supply, 2027 N. Broadway, Wichita, Kan.
Delta Fire & Safety Equip. Co., 525 Magazine St., New Orleans, La.
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Delta Fire & Safety Equip. Co., Scott Rd., Lafayette, La.
Blanchard Associates, Inc., Winthrop, Me.
Murphy, Joseph L., 15 School St., Bridgewater, Mass.
McCarthy, Justin A., Co., 176 Federal St., Boston, Mass.
Deane, David, 104 Washington Rd., Springfield, Mass.
American Fire Equip. Co., Boylston St., Boston, Mass.
Manufacturers Sales Co., 229 Parchmount Ave., Kalamazoo, Mich.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Seco Safety Products Co., 1300 W. Fort St., Detroit, Mich.
E & J Resuscitator Co., 3900 Grandy Ave., Detroit, Mich.
Minnesota Fire Equip. Co., 129 S. 10th St., Minneapolis, Minn.
Fire & Safety, Inc., 2104 2nd St., S.W., Rochester, Minn.
Ammerman, C. L., Co., 110 N. Second St., Minneapolis, Minn.
Mars, W. P. & R. S., Co., 324 Michigan Ave., Duluth, Minn.
Interstate Fire Equip., Rockledge-Lake Rd. No. 16, Versailles, Mo.
Safety Inc., 2608 Olive St., St. Louis, Mo.
Big Horn Supply Inc., 2120 3rd Ave., N., Billings, Mont.
Anderson Fire Equip. Co., 2421 Farnam St., Omaha, Neb.
Alexander, Nat, Co., Inc., Laurel Springs, N.J.
Fire Fighters Equip. Co., P.O. Box 324, Morris Plains, N.J.
Gold Crest Safety Equip., P.O. Box 155, Dunellen, N.J.
Guardian Safety Equip., 400 S. Jefferson St., Orange, N.J.
Hunt, James B., Mfg. Co., 1462 Liberty St., Trenton, N.J.
Murphy, Mike, 5 Jefferson Ave., Kearny, N.J.
New Jersey Fire Equip., 1000 N. Washington Ave., Dunellen, N.J.
Notte Safety Appliances Co., 308 Main St., E. Orange, N.J.
Security Fire Equip. Co., 19 Myrtle Ave., Trenton, N.J.
Williams, Thomas, Co., 202 River Rd., Red Bank, N.J.
American Ailsafe Co., 1245 Niagara St., Buffalo, N.Y.
American Ailsafe Co., 2704 Erie Blvd., E., Syracuse, N.Y.
Anthony Medical Supply, 320 Hempstead Ave., W. Hempstead, N.Y.
Bartels, Geo. H., Co., 188 Ann St., Pearl River, N.Y.
Eastern Fire Apparatus Co., 377 Plainfield St., Westbury, L.I., N.Y.
Finger Lakes Appl. & Municipal Equip. Co., W. Henrietta, N.Y.
Foss, Harlow, 335 S. Park Pl., E. Aurora, N.Y.
Lawless, W. J., 207 W. Third St., Elmira, N.Y.
Galway Fire Equip. Co., North St., Galway, N.Y.
Link Fire Equip. Service, P.O. Box 334, Utica, N.Y.
Long Island Fire Equip. Co., 280 Main St., Northport, L.I., N.Y.
Rochester Safety Equip., 83 Howell St., Rochester, N.Y.
Southern Oxygen Co., 15 W. 57th St. (Export Div.), New York, N.Y.
Syracuse Supply Co., 314 W. Fayette St., Syracuse, N.Y.
Times Industrial Supply Corp., Pt. Washington, L.I., N.Y.
Young Fire Equip. Corp., 1548 William St., Buffalo, N.Y.
Dayton Safety Supply Co., 316 Longworth St., Dayton, Ohio
Mannweiler, Carl A. J., & Son, 313 Ninth St., S.W., Massillon, Ohio
Ohio Safety Products Co., 528 Seymour Ave., Columbus, Ohio
Warren Fire Equip. Co., 411 E. Market St., Warren, Ohio
Guardian Safety Equip., 1742 S. Main St., Tulsa, Okla.
Munnell & Sherrill, Inc., 400 S.W., First Ave., Portland, Ore.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Super Fire Service, 1746 Wyoming Ave., Scranton, Pa.
Wagner, Hershey B., Rt. 1, Annville, Pa.
Yetzer, C. H., & Son, 304 Depot St., St. Marys, Pa.
Krauskopf, Fred, 415 Oreland Mill Rd., Oreland, Pa.
Quaker City Railroad Sales, 3207 Kensington Ave., Philadelphia, Pa.
Fyr-Fyter Sales & Service, 1019 W. 26th St., Erie, Pa.
Guardian Safety Equip., 214 S. 45th St., Philadelphia, Pa.
Adams, Geo. C., 6 Harris St., Riverside, R.I.
Engineering Supply Co., 6000 Denton Dr., Dallas, Tex.
Guardian Safety Equip., 1915 Westheimer, Houston, Tex.
Southwest Equip. & Extinguisher Co., 716 N. Brownlee, Corpus Christi, Tex.
Allied Safety Equip., Inc., 352 M&M Bldg., Houston, Tex.
Safety Equip. Distr. Co., 832 W. Main Ave., Knoxville, Tenn.
Clement Safety Equip. Co., 730 S. Third St., Memphis, Tenn.
Universal Safety & Fire Equip., 727 S.W. Temple, Salt Lake City, Utah
Curtis, L. N., & Sons, 1204 Westlake Ave., N., Seattle, Wash.
Otis Fire Equip. Co., Hortonville, Wis.
Pagel Safety Prod., Inc., 4611 W. National Ave., Milwaukee, Wis.
Queen City Supply Co., Inc., P.O. Box 372, Marinette, Wis.
Safety Supply Co., 214 King St., E., Toronto, Ont., Can.
Gaspro, Ltd., 500 Kuwill Blvd., Honolulu, Hawaii

Scott, Herman Hosmer, Inc.
385 Putnam Ave., Cambridge, Mass.

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Cawthorne, T. S., 16607 James Couzens Highway, Detroit, Mich.
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M-C Sales, 2201 Grand Ave., Kansas City, Mo.
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Kee Enterprises, 97 Reade St., New York, N.Y.
Jones, Ambos, Co., 3951 Lee Road, Cleveland, O.
Corry, Hal F., 6315 Hillcrest Ave., Dallas, Tex.

Searjeant Metal Products, Inc. 221
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Bullard, E. D., & Co., 275 8th St., San Francisco, Calif.
Smith-Keser & Co., College Hwy., Avon, Conn.
Direct Sales Co., 79 N. Main St., Waterbury, Conn.
Leu, Harry P., Inc., 109 W. Livingston Ave., Orlando, Fla.
Universal Safety Equip. Co., 5115 W. Diversey Ave., Chicago, Ill.
Martin, W. L., & Co., 224 S. Michigan Ave., Chicago, Ill.
Standard Industrial Products Co., 116 S. Garfield Ave., Peoria, Ill.
Cain Safety Service, 1318 Hoyt Ave., Indianapolis, Ind.
Iowa Safety Equip. Co., 414-416 12th St., Des Moines, Iowa
Louisville Mill Supply Co., 15th & Madison Sts., Louisville, Ky.
Boyer-Campbell Co., The, 6540 St. Antoine St., Detroit, Mich.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Continental Safety Equip., Inc., 1551 Selby Ave., St. Paul, Minn.
Sales Service Machine Tool Company, 2363 University Ave., St. Paul, Minn.
Notte, E. H., Safety Appl., 308 Main St., E. Orange, N.J.
Sanctuary, Harry I., 32 S. Bridge St., P.O. Box 1218, Poughkeepsie, N.Y.
Euramco Export Corp., 599 5th Ave., New York, N.Y. (Export)
Rochester Safety Equip. Co., 83 Howell St., Rochester, N.Y.
Safety Clothing & Equip. Co., 1990 E. 69th St., Cleveland, Ohio
Scallan Supply Co., 2337-2339 Gilbert Ave., Cincinnati, Ohio
Acme Safety Products Co., 1823 Vermont St., Toledo, Ohio
Technical Safety Prod. Co., 315 Sherbrook Blvd., Upper Darby, Pa.
Star Machinery Co., 241 Lauder St., Seattle, Wash.
Universal Safety Equip. Co., 3155 S. 7th St., Milwaukee, Wis.
Safety Supply Co., 214 King St., E., Toronto, Ont., Can.
Dominion Power Press Equip. Ltd., Graham's Lane, Burlington, Ont., Can.

Sebrell, J. B., Corporation
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Seco Engineering & Mfg., Inc.
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Campbell, J. L., Co., 8117 Germantown Ave., Philadelphia, Pa.
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Alsco Welding Equip., 2202 Garfield Ave., Los Angeles, Calif.
Foss, M. L., Inc., 1901 Araphoe St., Denver, Colo.
Florida Gas & Chemical, 3000 Sterling Rd., Hollywood, Fla.
Georgia Supply Co., 821 E. Bay St., Jacksonville, Fla.
General Welding Supply Co., Adamo Drive & 22nd St., Tampa, Fla.
Barrington Safety Equip., Rt. 1, Parkaire Field, Marietta, Ga.
Engelhardt, George A., Co., 1060 Milwaukee Ave., Chicago, Ill.
McMaster-Carr Supply, 640 W. Lake St., Chicago, Ill.
Louisiana Welding, 1931 Plank Rd., Baton Rouge, La.
Acme Welding Equip. & Sup., 926 Tchoupitoulas, New Orleans, La.
Gulf Welding & Equip., 3033 Tchoupitoulas, New Orleans, La.
Wilson Welding Supply, McMullen Hwy. & U. S. Rt. 220, Cumberland, Md.
Speidel Safety Service, 22150 W. Hampton, Oak Park, Mich.
Elvin First Aid, 327 2nd Ave. N., Minneapolis, Minn.
Reis Equipment Co., 1417 Tower Grove, St. Louis, Mo.
Wilkie Optical, Inc., Shreve Ave. & N.J. Turnpike, Barrington, N.J.
Duggan Safety Products, 28 W. Hamilton Ave., Englewood, N.J.
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Carolina Welding Supply, 419 Dupont Circle, Raleigh, N.C.
Edmac, Inc., 1015 N. Liberty St., Winston Salem, N.C.
Welding Equipment Co., 2329 S. Walker, Oklahoma City, Okla.
Protective Clothing Co., No. 2 Dormont & Dell Ave., Pittsburgh, Pa.
Welding Gas Products Co., 831 East 11th St., Chattanooga, Tenn.
Industrial Safety Equip., 1921 Church St., Nashville, Tenn.
Welders Supply, Inc., 430 S. Industrial Rd., Dallas, Tex.
Big Three Welding Equip., 3602 W. 11th St., Houston, Tex.
L. A. Manson, 2416 Bolsover, Houston, Tex.
Smith Weld Co., 3602 W. 11th St., Houston, Tex.
Pocahontas Welding Supply, 110 Spruce St., Bluefield, W.Va.
Virginia Welding Supply, 114 Virginia St., E., Charleston, W.Va.
W. A. Vorpahl, 1049 Langlade, Green Bay, Wis.
Randall Graw Co., 314 Jay St., La Crosse, Wis.
Taylor Fearson & Carson, 10215 103rd St., Edmonton, Alberta, Can.
Reno Fire Fighting Equip., 629 Wall St., Winnipeg, Manitoba, Can.
Consolidated Fire & Safety, 4614 St. Catherine, W., Montreal, Quebec, Can.
Oxigeno de Chihuhua, Avedia Juarez y 514, Chihuahua, Chi.
Electrodas Monterrey S.A., Avenida Chapultapec, Mexico, D. F.
Gases y Electrodas S.A., 5 de Mayo 1175 PTE, S.A., Monterrey, N. L.
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Universal Safety Equip. Co., 5115 W. Diversey Ave., Chicago, Ill.
Safety Equip. Supply Co., 7747 W. Ardmore Ave., Chicago, Ill.
General Industrial Co., 5738 N. Elston Ave., Chicago, Ill.
Standard Industrial Products, 920 N. Garfield Ave., Peoria, Ill.
Cain Safety Service, 1318 Hoyt Ave., Indianapolis, Ind.
Fire Equip. Service, 403 E. Main St., Muncie, Ind.
Argus Supply Co., 4340 E. Davison St., Detroit, Mich.
Reis Equip. Co., 1417 Tower Grove Ave., St. Louis, Mo.
New Jersey Safety Equip. Co., 299 Park Ave., East Orange, N.J.
Safeguard Industrial Equip. Co., 271 Verona Ave., Newark, N.J.
Guardian Safety Equip. Co., 400 S. Jefferson St., Orange, N.J.
Pulmosan Safety Equip. Co., 644 Pacific St., Brooklyn, N.Y.
Steinwachs' Safety Supply, 1573 S. Park Ave., Buffalo, N.Y.
American Allsafe Co. Inc., 1245 Niagara St., Buffalo, N.Y.
Rochester Safety Equip. Co., 83 Howell St., Rochester, N.Y.
Safe-Quip Inc., 85 Ave. E., Rochester, N.Y.
Acme Safety Products Co., 387 Storer Ave., Akron, Ohio
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Pagel Safety Products Inc., 4611 W. National Ave., Milwaukee, Wis.

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Laub, Nick J., Co., 4710 Quail Ave., N., Minneapolis, Minn.
Kay Sales Co., 2600 Grand Ave., Kansas City, Mo.
Land-O-Air Sales Co., 140 Marbledale Road, Tuckahoe, N.Y.
Edwards-Lohse & Co., 2123 E. 9th St., Cleveland, Ohio
Schoonmaker, J. Y., Co., 2011 Cedar Springs, Dallas, Tex.

Speakman Co.
P. O. Box 191, Wilmington 99, Del.

Speedi-Dri Corp. 43
83 Essex Turnpike, Menlo Park, N. J.

Sperti-Faraday, Inc.
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2004 Locust, St. Louis, Mo.
734 Wakefield Dr., Cincinnati, Ohio
Bessemer Bldg., 104 Sixth, Pittsburgh, Pa.
1709 Race St., Philadelphia, Pa.
389 St. Paul St., Rm. 106, Montreal, Que., Can.
AGENTS:
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Schow, Robert M., 1709 W. 8th St., Los Angeles, Calif.
Gaer, Glenn B., 1470 Galapago, Denver, Colo.
Holmyard, H. R., P.O. Box 107, Miami, Fla.
Koeln, George R., 144 Walker St., Atlanta, Ga.
Dickinson, Harry, 11 S. Meridian, Indianapolis, Ind.
Dean, J. M., - Deco Eng., 1112 Locust, Des Moines, Iowa
Corrigan, C. E., Jr., 504 Delta Bldg., New Orleans, La.
Sullivan, R. J., Co., 176 Federal St., Boston, Mass.
Page, Cooper, Co., 617 National Bldg., Minneapolis, Minn.
Howe, W. F., & Co., 500 Porter Bldg., Kansas City, Mo.
Deco Engineering Products, 4305 N. 54th, Omaha, Neb.
Guiterman Co., Inc., 35 S. William, New York, N.Y.
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Kurtz, Nufer, Mfrs. Agency, Hippodrome Annex Bldg., Cleveland, Ohio
Kurtz, Nufer, Mfrs. Agency, 1021 19th, Canton, Ohio
Munding, W. A., 166 Monroe St., Memphis, Tenn.
Rose, L. B., Trough Bldrs. Exch., Memphis, Tenn.
Michler, F. A., 2807 Allen St., Dallas, Tex.
Winkler, B. T., 776A M&M Bldg., Houston, Tex.
Slusser, L. M., 318 Dooley Bldg., Salt Lake City, Utah
Wheat, W. W., & Son, 2219 4th Ave., Seattle, Wash.
Beven, Harry, 2757 N. 40th St., Milwaukee, Wis.
Von Hamm Young Co., P.O. Box 2630, Honolulu, Hawaii

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5106 York Road, Baltimore, Md.
1662 Penobscot Bldg., Detroit, Mich.
620 W. 26th St., Kansas City, Mo.
3820 Washington Blvd., St. Louis, Mo.
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101 W. 31st St., Room 2304, New York, N.Y.
6007 Euclid Ave., Cleveland, Ohio

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1501 N. Johnson St., South Bend, Ind.
6385 So. West 10th St., Des Moines, Iowa
415 Natchez, New Orleans, La.
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4328 Russel Ave., N., Minneapolis, Minn.
4138 Broadway, Kansas City, Mo.
6414A So. Hampton Ave., St. Louis, Mo.
220 Delaware Ave., Buffalo, N.Y.
50 Church St., New York, N.Y.
2360 James St., Syracuse, N.Y.
2010 E. 102nd St., Cleveland, Ohio
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1221 Linwood, Oklahoma City, Okla.
1725 N.E. 44th, Portland, Ore.
Bessemer Bldg., Pittsburgh, Pa.
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10582 Spangler Rd., Dallas, Texas
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243 E. Third South, Salt Lake City, Utah
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7613 West State St., Milwaukee, Wis.
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Hatcher Sales Co., 542 Forrest Rd., N.E., Atlanta, Ga.
Hirsh Electronics, 1658 Union Ave., Memphis, Tenn.
Electrical Engineering & Sales Corp., 2030 Texas St., El Paso, Texas
Harding, John J., Co., 1514 Kona St., Honolulu, Hawaii
Standard Electric Time Co. of Canada, Ltd., 726 St. Felix, Montreal, Quebec, Can.

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Guardian Safety Equip. Co., 400 S. Jefferson, Orange, N.J.
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Acme Safety Prod. Co., 387 Storer Ave., Akron, Ohio

Standard Safety Equipment Co. ...59, 114, 119, 124, 126, 131, 167, 168, 184, 185, 221, 242
232 W. Ontario St., Chicago 10, Ill.
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Dickson Safety Prod., 2952 Crenshaw Blvd., Los Angeles, Calif.
Universal Safety Equip., 5115 W. Diversey, Chicago, Ill.
Standard Industrial Prod., 116 S. Garfield, Peoria, Ill.
Iowa Safety Equip. Co., 414-416 Twelfth St., Des Moines, Iowa
Orr Safety Equip., 1920 W. Main St., Louisville, Ky.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Averill Equip. Co., 19225 Conant Ave., Detroit, Mich.
Boyer-Campbell Co., 6540 St. Antoine St., Detroit, Mich.
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Guardian Safety Equip., 400 S. Jefferson St., Orange, N.J.
American Allsafe Co., 1245 Niagara St., Buffalo, N.Y.
Safety Clothing & Equip., 1990 E. 69th St., Cleveland, Ohio
Dayton Safety Supply, 316 Longworth St., Dayton, Ohio
Acme Safety Prod. Co., 387 Storer Ave., Akron, Ohio
Ohio Safety Prod. Co., 528 Seymour Ave., Columbus, Ohio
Pendergast, A. W., Safety Equip., 2913 Tulip St., Philadelphia, Pa.
Guardian Safety Equip., 214-16 S. 45th St., Philadelphia, Pa.
Somers, Fitler & Todd Co., 327 Fort Pitt Blvd., Pittsburgh, Pa.
Genter, C. D., Co., 2109 Broad St., Chattanooga, Tenn.
Manson, L. A., & Co., 2416 Bolsover, Houston, Tex.
Levitt Safety Ltd., 747 Vaughan Rd., Toronto, Ont., Can.
Safety Supply Co., 214 King St., E., Toronto, Ont., Can.
Equipos de Seguridad, S.A., Sullivan 95, Mexico City, Mex.

Standard Signs, Inc. 286, 287
3190 E. 65st St., Cleveland 4, Ohio

Steel Scaffolding Company
856 Humboldt St., Brooklyn 22, N. Y.

Stepan Chemical Co. 66
20 N. Wacker Dr., Chicago, Ill.

Stephenson Corp. 264
P. O. Box 392, Red Bank, N. J.
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Durr Surgical Supply Co., 228 Commerce St., Montgomery, Ala.
Aloe, A. S., Co., 1150 S. Flower St., Los Angeles, Calif.
McDonald, R. F., Co., 5721 W. 96th St., Los Angeles, Calif.
Sherman, Earl, & Co., 2526 Wood St., Oakland, Calif.
Western Fire Dept. Sup. Co., 1011 Larimer St., Denver, Colo.
Duncan Fire & Safety Equip., 105 S. Lincoln St., Wilmington, Del.
Culbert, Glenn D., Co., 3217 12th St., N.E., Washington, D.C.
American Surgical Supply Corp., 489 Peachtree St., Atlanta, Ga.
Hancock, J. H., 1624 Candler Bldg., Atlanta, Ga.
Fire & Safety Equip. Co., 2098 N. 7th St., Springfield, Ill.
Renaldi, J. A., Co., 11327 Wallace St., Chicago, Ill.
Ed's Fire Service, 1908 N. Crawford St., Carroll, Iowa
Coe Surgical Supply Co., 506 E. Third St., Wichita, Kan.
Schmitt, Robert L., Co., 306 E. Main St., Louisville, Ky.
Southern Surgical Sup. Co., 741 St. Charles St., New Orleans, La.
Eastern Fire Equip. Co., 403 Fore St., Portland, Me.
Baumgartner, Murray, Surgical Instrument Co., 5 W. Chase St., Baltimore, Md.
Yankee Engineering Co., Inc., 3500 Washington Blvd., Baltimore, Md.
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Nelson, A. E., Co., 13740 Long Lake Dr., Sparta, Mich.
Randolph Surgical Sup. Co., 60 W. Columbia St., Detroit, Mich.

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Zink Safety Equip. Co., 700 W. 12th St., Kansas City, Mo.
Zink Safety Equip. Co., 1110 S. Brentwood, St. Louis, Mo.
Falvey Surgical Supply Co., 412 Morris Ave., Elizabeth, N.J.
Cochrane Physicians' Supply, Inc., 133 E. 58th St., New York, N.Y.
Fire Fighting Equip. Co., 1129 Seymour Ave., Utica, N.Y.
Garrett, John R., Co., 1712 5th Ave., Troy, N.Y.
Noonan, T. J., Co., 579 New Scotland Ave., Albany, N.Y.
Rocklyn Surgical Supply Co., 65 N. Park Ave., Rockville Center, L.I., N.Y.
Sunrise Surgical Supply Co., 115 E. Union St., Bay Shore, N.Y.
Youngs Fire Equip. Co., 1548 William St., Buffalo, N.Y.
Medical Gas. Prod. Div. of National Welders, State & Gesco Sts., Charlotte, N.C.
Crocker-Fels Co., 215 E. 8th St., Cincinnati, Ohio
Orr Safety Supply Co., 2853 Colerain Ave., Cincinnati, Ohio
Radabaugh-Fetzer Co., 1737 E. 12th St., Cleveland, Ohio
Wilco Fire Equip. Co., 1123 S.E. Market St., Portland, Ore.
Fire Protection & Safety Equip. Co., 509 Maclay St., Harrisburg, Pa.
Page, Arthur C., Assoc., 215 5th Ave., Dravosburg, Pa.
Clement Safety Equip. Co., 720 S. 3rd St., Memphis, Tenn.
Massey Surgical Supply, Inc., 2110 West End Ave., Nashville, Tenn.
Massey Surgical Supply, Inc., 411 W. Main St., Knoxville, Tenn.
Smalling & Co., 604 Demonbreun St., Nashville, Tenn.
Waters, Gordon, 5631 Ridgedale Ave., Dallas, Tex.
Powers & Anderson, Inc., 1657 Broad St., Richmond, Va.
Fire Protection Service, 1139 Mulberry Circle, Charleston, W.Va.

Sterling Siren Fire Alarm Co., Inc.
6 Bartlett St., Rochester 8, N. Y.

Stonehouse Signs, Inc. **271**
842 Larimer St., Denver 4, Colo.

Stop-Fire, Inc.
125 Ashland Place, Brooklyn 1, N. Y.

Sugar Beet Products Co.
302 Waller St., Saginaw 60, Mich.

Superior Rubber Mfg. Co.
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1512 So. Pulaski Rd., Chicago, Ill.

Taller & Cooper, Inc.
75 Front St., Brooklyn, N. Y.

Tamco, Inc.
P. O. Box 10344, Pittsburgh, Pa.

Tamms Industries, Inc.
228 N. La Salle St., Chicago 1, Ill.

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Warren, Ohio

Taylor, S. G., Chain Co. **205**
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Hill Brothers Chemical Co., 2159 Bay St., Los Angeles, Calif.
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McGuire & Co., 833-47th Ave., Oakland, Calif.
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Independent Oil Company, The, 3930-60 Chouteau Ave., St. Louis, Mo.
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Farley Solvent Co., Inc., 309 Silver St., Akron, Ohio
United Chemical Co. Inc., 324 N. W. Glisan St., Portland, Ore.
Burkart-Schier Chem. Co., Chattanooga, Tenn.
Burkart-Schier Chem. Co., Nashville, Tenn.
Great Western Chem. Co., 6921 E. Marginal Way, Seattle, Wash.
Commerce Industrial Chemicals, Inc., 6377 N. Teutonia Ave., Milwaukee, Wis.
Safety Supply Co., 214 King St. E., Toronto, Ontario

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Gardner Rd., Broadview, Ill.
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Boldt, Wm. D., 1430 Wendan Dr., Decatur, Ga.
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Templeton, A. C., 5627 Del Roy Dr., Dallas, Tex.

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Cohler, I. H., 510 N. Dearborn, Rm. 926, Boyce Bldg., Chicago, Ill.
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Stewart, Carl, 415 E. Jefferson, Syracuse, N.Y.
Williams, R. L., 2200 N. W. 56th St., Oklahoma City, Okla.
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Yates, O. C., 2609 Second Ave., Seattle, Wash.

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Training Aids Co. **285**
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Trumbull Mfg. Co.
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8 Morris St., Paterson, N.J.
1468 W. 9th St., Cleveland, Ohio
95 Fairmount Ave., Philadelphia, Pa.
1606 Henderson St., Houston, Tex.
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U-C Lite Mfg. Co. **254**
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21st & Manchester Ave., Kansas City 3, Mo.
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Welders Supply Co., 608 Thomas St., Little Rock, Ark.
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Balsam Brothers, 1421 Park Ave., Emeryville, Calif.
Arrow Welding Supply, 3918 Foothill Blvd., Oakland, Calif.
Welding Service Sales, Inc., 926 Howard St., Oakland, Calif.
Auto Battery & Elec. Co., 95 Truman St., New London, Conn.
Harris Sales & Service Co., 112 Quinnipac Ave., North Haven, Conn.
Hendrie & Bolthoff, 1635 17th St., Denver, Colo.
Anchor Welding Supply, 1339 Thatcher St., Wilmington, Del.
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Leo, Harry P., Inc., Box 2513, Orlando, Fla.
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Pye-Barker Welding Supply Co., 231 Pryor St., S.W., Atlanta, Ga.
Equip. Supply & Service Co., 1328 Webster Ave., Columbus, Ga.
Middle Georgia Oxygen Co., 220 Walnut St., Macon, Ga.
Welding Process & Equip. Co., 1302 Bryn Mawr Ave., Chicago, Ill.
Welding Service & Supplies Co., 1830 S. Cicero Ave., Chicago, Ill.
Depke Welding Supplies, 628 E. Williams, Danville, Ill.
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Welders Supply Co., Inc., 1860 E. Main St., New Iberia, La.
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Monroe Welding Supply, 605 N. 17th St., Monroe, La.
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District Oxygen Co., Inc., 3861 Bunker Hill Rd., Brentwood, Md.
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Saginaw Welding Supply Co., 426 S. Washington, Saginaw, Mich.
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Puritan Compressed Gas Corp., 2012 Grand Ave., Kansas City, Mo.
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Production Materials Co., 635 N. Prior, St. Paul, Minn.
Welders Supply Co., 2126 Cuming St., Omaha, Nebr.
Lincoln Welding Supply, Lincoln, Nebr.
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Essex Welding Equip. Co., 17-19 Tichenor Lane, Newark, N.J.
Goodliffe, J. W., & Son, 1900 E. Elizabeth Ave., Linden, N.J.
Mercer Oxygen & Supply Co., Inc., 1840 Olden Ave. Extn., Trenton, N.J.
General Welding Supply Corp., 189 Third St., Mineola, N.Y.
Zimmer Welding Supply, 249 Fourth Ave., Brooklyn, N.Y.
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Monson Welding Sales, Inc., 261 James St., Syracuse, N.Y.
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St. Louis Co., A. H., 29 Richardson Ave., Utica, N.Y.
Jackson Welding Supply Co., Inc., 1225 Mt. Read Blvd., Rochester, N.Y.
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Mahoning Valley Supply Co., 704 Youngstown-Poland Rd., Youngstown, Ohio
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Buckeye Metals & Supply Co., 258 Kenmore Blvd., Akron, Ohio
Mahoning Valley Supply Co., 2401 Shepler Rd., Canton, Ohio
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Ohio Valley Sales Co., Brazee St. & Enyart Ave., Cincinnati, Ohio
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Jones Co., The Jimmie, 1016 E. 4th St., Tulsa, Okla.
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Myrow, C. F., Supply Co., 4018 Aberdeen Way, Houston, Tex.
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Southwestern Welding Supply Co., San Angelo, Tex.
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Western Oxygen, Inc., 2447 6th Ave., S., Seattle, Wash.
Ace Welding & Safety Supply Co., 4325 S. Howell, Milwaukee, Wis.
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542 S. Dearborn St., Chicago, Ill.
105 E. 106th St., New York, N.Y.
5023 N.E. Sandy Blvd., Portland, Ore.
2227 Bryant St., Dallas, Tex.

Universal Match Corp.
1501 Locust, St. Louis, Mo.
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1295 Lincoln Rd., Miami Beach, Fla.
3282 S.W. 7th St., Miami, Fla.
1145 Mary St., Jacksonville, Fla.
32-A Western Union Bldg., Tampa, Fla.
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3553 W. Peterson Ave., Chicago, Ill.
5407 North N.J. Ave., Indianapolis, Ind.
1211—62nd St., Des Moines, Iowa
723 S. Broadway, Wichita, Kans.
115 S. Webster Parkway, Louisville, Ky.
625 Baronne St., New Orleans, La.
2510 St. Paul, Baltimore, Md.
148 State St., Boston, Mass.
10 Sherburne Ave., Worcester, Mass.
111 Plymouth Bldg., Minneapolis, Minn.
2150 Randolph Ave., St. Paul, Minn.
14300 W. McNichols Rd., Detroit, Mich.
710 W. Paterson Ave., Flint, Mich.
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905 National Bank Bldg., Jackson, Mich.
912 Baltimore, Kansas City, Mo.
1708 Olive St., St. Louis, Mo.
1365 S. 40th St., Lincoln, Nebr.
P.O. Box 165, Omaha, Nebr.
145 Hanabury Ave., Newark, N.J.
1241 Western Ave., Albany, N.Y.
170 Franklin, Buffalo, N.Y.
516 Fifth Ave., New York City, N.Y.
805 Main St., Olean, N.Y.
1212 Granite Bldg., Rochester, N.Y.
123 Maple Rd., Syracuse, N.Y.
54 Tarrytown Rd., White Plains, N.Y.
2134 W. Morehead St., Charlotte, N.C.
1803 Carew Tower Bldg., Cincinnati, Ohio
1836 Euclid, Cleveland, Ohio
402—12th Ave., Columbus, Ohio
2507 Georgetown Ave., Toledo, Ohio
1303 Ann Arbor Drive, Norman, Okla.
1233 N.W. 12th Ave., Portland, Ore.
3412 N. Fourth St., Harrisburg, Pa.
508-509 Park Bldg., Pittsburgh, Pa.
274 Doric Ave., Cranston, R.I.
5526 Dyer St., Dallas, Texas
304 Sinclair Bldg., Fort Worth, Texas
4904 Travis, Houston, Texas
1388 Madison Ave., Memphis, Tenn.
107 Cherry St., Seattle, Wash.
P.O. Box 125, Tacoma, Wash.
161 W. Wisconsin Ave., Milwaukee, Wis

U. S. Rubber Co. 16
Footwear Div.—Industrial
Box 12, Station G, New York, N. Y.

U. S. Safety Service Co. 60, 102-103
1215 McGee St., Kansas City 6, Mo.
BRANCH OFFICES:
1727 Sixth Ave., N., Birmingham, Ala.
4508 Crenshaw Blvd., Los Angeles, Calif.
5814 College Ave., Oakland, Calif.
1650 17th St., Denver, Colo.
119 Ann St., Hartford, Conn.
1424 "K" St., Washington, D.C.
333 Candler Bldg., Atlanta, Ga.
11107 S. Longwood Dr., Chicago, Ill.
55 W. 30th, Box 5061, Indianapolis, Ind.
660 S. 5th, Louisville, Ky.
751 Little Bldg., Boston, Mass.
501 Mathieson, Baltimore, Md.
15831 Jas. Couzens Hy., Detroit, Mich.
210 S. 5th, Minneapolis, Minn.
614 Paul Brown Bldg., St. Louis, Mo.
1066 Prudential Bldg., Buffalo, N.Y.
166 5th Ave., Rm. 716, New York, N.Y.
712 State Tower Bldg., Syracuse, N.Y.
307 E. 4th St., Cincinnati, Ohio
14812 Detroit Ave., Cleveland, Ohio
Hartman Theater Bldg., Columbus, Ohio
714 Enterprise Bldg., Tulsa, Okla.
412 Scott Bldg., Portland, Ore.
101 Investment Bldg., Pittsburgh, Pa.
1123 West'n. Svgs. Fund Bldg., Philadelphia, Pa.
3822 Almeda, Houston, Tex.
504 Interurban Bldg., Dallas, Tex.
422 Smith Tower, Seattle, Wash.
432 Empire Bldg., Milwaukee, Wis.
Box 1518, Honolulu, T.H.
16 Heintzman Ave., Toronto, Ont., Can. (Parmelee Ltd.)
660 St. Catherine, Montreal, P.Q., Can. (Parmelee Ltd.)

U. S. Steel Corp. 25
525 William Penn Place, Pittsburgh 30, Pa.
Sales Offices located in all major cities
DISTRIBUTORS:
Tennessee Coal & Iron, P.O. Box 599, Fairfield, Ala.
Columbia-Geneva Steel, 120 Montgomery St., San Francisco, Calif.
U.S. Steel Export Co., 30 Church St., New York, N.Y.
American Steel & Wire, Rockefeller Bldg., Cleveland, Ohio

—V—

Vacuum Can Co. 76
19 S. Hoyne Ave., Chicago 12, Ill.
DISTRIBUTORS:
Davis, F. A., & Sons, Inc., 119 S. Howard St., Baltimore, Md.
Johnson, H. A., Co., 155 N. Beacon St., Boston (Brighton), Mass.
King Coffee Co., 2727 Edsel Ford Expressway, Detroit, Mich.
McGarvey-Atwood Coffee Co., 1129 Currie Ave., Minneapolis, Minn.
Cain, A. L., & Sons, Inc., 902 Broadway, New York, N.Y.
Boyd Coffee Co., 1336 S.W. Second Ave., Portland, Ore.
Restaurant & Store Equip. Co., 136 S.W. Temple St., Salt Lake City, Utah
Brown, H. A., Ltd., 296 Main St., Toronto, Ont., Can.
Russell Food Equip. Ltd., 871 Homer Ave., Vancouver, B.C., Can.
Williams Rest. Supply, Ltd., 278 Rupert St., Winnipeg, Manitoba, Can.

Vari-Products Co.
2450 S. Prairie Ave., Chicago 16, Ill.

Vestal, Inc.
4963 Manchester Ave., St. Louis 10, Mo.
BRANCH OFFICES:
1340 E. Sixth St., Los Angeles, Calif.
164 Townsend, San Francisco, Calif.
50 Florida Ave., N.E., Washington, D.C.
3651 N.W. 51st St., Miami, Fla.
2016 W. Carroll, Chicago, Ill.
2112 Grand Ave., Kansas City, Mo.
629 Grove St., Jersey City, N.J.
8 Circle St., Rochester, N.Y.
Broad & Cumberland Sts., Philadelphia, Pa.
703 T & P Terminal Warehouse Bldg., Fort Worth, Tex.
102 San Jacinto St., Houston, Tex.
2115 N. 34th St., Seattle, Wash.

Victor Animatograph Corp.
Davenport Bank Bldg., Davenport, Ia.
BRANCH OFFICES:
5844 W. Addison St., Chicago, Ill.
200 W. 57th St., New York, N.Y.
DISTRIBUTORS located in principal cities.

—W—

Wachs, E. H., Co.
1525 N. Dayton St., Chicago 22, Ill.

Waco Mfg. Co.
3565 Wooddale Ave., Minneapolis 16, Minn.
BRANCH OFFICE:
5251 W. 130th St., Cleveland, Ohio
DISTRIBUTORS:
Waco Scaffolding & Fence Co., P.O. Box 1971, Montgomery, Ala.
Stone, Sam K., 906 Towson Ave., P.O. Box 283, Fort Smith, Ark.
Waco Scaffolding & Equip. Co., 1723 W. Culver St., Phoenix, Ariz.

Please mention National Safety News when contacting any of these organizations.

Franklin's Rental & Sales Co., 930 E. Ft. Lowell, Tucson, Ariz.
Waco-May Co., 3129 Riverside Dr., Los Angeles, Calif.
Southern Equip. & Supply Co., P.O. Box 550, San Diego, Calif.
Laurence Myers & Co., 61 Bluxome St., San Francisco, Calif.
Waco Scaffolding Co., 2092 S. El Dorado St., Stockton, Calif.
Professional Paints Inc., 3600 E. 45th Ave., Denver, Colo.
Hackbarth, E. G., Co., Sandbank Rd., Cheshire, Conn.
MacBryde, John S., Co., Inc., 9th & Evarts Sts., N.E., Washington, D.C.
Ray's Contractors Equip. Co., Ltd., 1212 Mary St., Jacksonville, Fla.
Waco Scaffolding of Fla., P.O. Box 458, Lakeland, Fla.
Construction Equip., Inc., 7000 Grand Central, Clearwater, Fla.
Haynes Painting & Decorating Co., 2011 N. Dixie Hwy., Lake Worth, Fla.
Waco Scaffolding of Fla., P.O. Box 178, Miami, Fla.
Waco Scaffolding of Fla., 719 Brookhorn Drive, Orlando, Fla.
Construction Equip. Inc., 1701 Central Ave., St. Petersburg, Fla.
Crenshaw Supply Co., 724 Boulevard, N.E., Atlanta, Ga.
Koretz, Adolph, Co., 3319 N. Marshfield Ave., Chicago, Ill.
Reid-Holcomb Co., Inc., 1815 Kentucky Ave., Indianapolis, Ind.
Waterloo Steel & Equip. Co., 524 Park Rd., Waterloo, Ia.
Schreiber Co., 637 Baxter St., Louisville, Ky.
Engle Construction & Supply Co., 905-907 National Ave., Lexington, Ky.
Builders Supply Co., Inc., P.O. Box 295, Foot of 3rd St., Shreveport, La.
George Kellett & Sons Inc., 1330 Press St., New Orleans, La.
Waco Scaffolding Co. of Holbrook, Inc., 289 N. Franklin St., Holbrook, Mass.
Waco Equip. of New England Inc., 53 State St., Boston, Mass.
Scaffolding Inc., 102 W. State Fair Ave., Detroit, Mich.
Great Lakes Equip Co., 1461 Evanston Ave., Muskegon, Mich.
Waco Scaffolding & Supply Co., 239 Belgrade Ave., Mankato, Minn.
Waco Scaffolding Co., Inc., 1108 S. Third St., Minneapolis, Minn.
Garrity, J. B., Co., 556 Westport Rd., Kansas City, Mo.
Scaffold Rental & Sales Co., 4515 Military Ave., Omaha, Nebr.
Scaffold Rental & Sales Co., 223 S. Burlington, Hastings, Nebr.
Scaffold Rental & Sales Co., 2200 "Y" St., Lincoln, Nebr.
Inland Supply Co., 818 S. Main St., Las Vegas, Nev.
Reid & Skinner Corp., 689 S. 12th St., Newark, N.J.
New Mexico Equip. Co., 2222 S. Broadway, Albuquerque, N. Mex.
Waco Equip. Co. of Albany, 167 Chestnut St., Albany, N.Y.
Bacon-Wolforth Corp., 10-02 34th Ave., Long Island City, N.Y.
MacMackin, F. J., Co., 52 Genesee St., Utica, N.Y.
Brower Scaffolding Co., Inc., 1612 Madison Ave., Greensboro, N.C.
Dinnie Bldrs. Supply, 206 9th Ave., N., Grand Forks, N.D.
Akron-Waco, 308 Metropolitan Bldg., Akron, O.
Tyson Distributors, Inc., 3660 Shaw Ave., Cincinnati, Ohio
Waco Scaffolding Co., 10311 Barrett Ave., Cleveland, Ohio
Wylie-Stewart Machinery Co., 1400 Exchange Ave., Oklahoma City, Okla.
Wylie-Stewart Machinery Co., P.O. 3216, Whittier Sta., 2443 Dawson Rd., Tulsa, Okla.
Home Makers Supply Co., 824 South West 18th St., Portland, Ore.
Waco Scaffolding Co., 1472 Wyoming Ave., Forty-Fort, Pa.
Waco Scaffolding Co. of Phila., 1363 E. High St., Philadelphia, Pa.
Best Equip. Co., 1912 Beaver Ave., Pittsburgh, Pa.
Seaber & Aiken, P.O. Box 5271, Columbia, S.C.
Houston, Stan, Equip. Co., 34th & S. Minnesota, Sioux Falls, S.D.
Pinner, L. A., Steel Forms, 2114 Dawes, P.O. Box 6762, Dallas, Tex.
Waco Scaffolding Co., 5702 Navigation Blvd., Houston, Tex.
Texas Steel Scaffolds Co., 3812 S. Flores, San Antonio, Tex.
Waco Scaffolding Co., Inc., 909 S. 7th West, Salt Lake City, Utah
Whitlock Bros., 3612 High St., Portsmouth, Va.
Construction Equip. Co., W-1118 Ide Ave., Spokane, Wash.
West Virginia Steel Corp., 900 Brooks St., Charleston, W. Va.
Distributors, Inc., 1672 Morrow St., Green Bay, Wis.
Waco Scaffolding Co., Inc., 1109 N. 108th St., Milwaukee, Wis.

Wagco Products, Inc.
14615 Meyers Road, Detroit 27, Mich.

Wagner Sign Service, Inc. **278**
356 S. Hoyne Ave., Chicago 12, Ill.

Wallace Optical Co., Inc.
1025 Brush, Detroit 26, Mich.

Walpole Co. **202**
100 Boylston St., Boston, Mass.

Washington Products Co. **263**
238 S. Fayette St., Washington C. H., Ohio
DISTRIBUTORS:
Midwest Fire & Safety Equip. Corp., 1605 Prospect St., Indianapolis, Ind.
American Fire Equip. Co., 717 Boylston St., Boston, Mass.
Garland Supply Co., Whitman, Mass.
Gold Crest Safety Equip. Corp., Highway 29, P.O. Box 155, Dunellen, N.J.
New Jersey Fire Equip. Corp., 1000 Washington Ave., Dunellen, N.J.
Ralph, V. E., & Son, 50-52 N. 19th St., East Orange, N.J.
Keefe & Keefe, Inc., 874 Lexington Ave., New York, N.Y.
Brooks, Earl A., U.S. Rt. No. 30, Coatesville, Pa.
Fyr-Fyter Sales & Service, Madison, Wis.

Watchemoket Optical Co., Inc. **94-95**
234 W. Exchange St., Providence 3, R. I.
BRANCH OFFICE:
29 E. Madison St., Chicago, Ill.

Watts Regulator Co.
10 Embankment St., Lawrence, Mass.

Waverly Petroleum Products Co. **48**
1724 Chestnut St., Philadelphia 3, Pa.

Wearhide Glove Co.
Rockford, Mich.
DISTRIBUTORS:
Scientific Industrial Supply Co., Chicago, Ill.
Delta Fire & Safety Equipment Co., Lafayette, La.
Safety Services, Inc., Kalamazoo, Mich.
Notte, E. H., Inc., East Orange, N. J.
Texler, H., Glove Co., Plainfield, N.J.
American All Safe Co., Buffalo, N.Y.
Acme Safety Products Co., Akron, Ohio
Record Industrial Co., Philadelphia, Pa.
Phoenix Rubber Co., Memphis, Tenn.
Tidewater Supply Co., Norfolk, Va.
Industrial Safety Supply Co., Charleston, W. Va.

Wear-Proof Mat Co. **24**
2156 Fulton St., Chicago, Ill.

Welsh Mfg. Co. **117**
9 Magnolia St., Providence 9, R. I.

Werner, R. D. Co., Inc.
295 Fifth Ave., New York, N. Y.

West Disinfecting Co. **65**
42 - 16 West St., Long Island City 1, N. Y.
BRANCH OFFICES:
1209 1st Ave., S., Birmingham, Ala.
2110-16 E. 37th St., Los Angeles, Calif.
921 Bryant St., San Francisco, Calif.
4742-64 So. Kedzie Ave., Chicago, Ill.
49 Fawcett St., Cambridge, Mass.
3411 Gratiot St., St. Louis, Mo.
3140-3150 Berea Rd., Cleveland, Ohio
49th & Grays Ave., Philadelphia, Pa.
5416 Maple Ave., Dallas, Tex.
2924 Western Ave., Seattle, Wash.

Western Lithograph Co.,
Westline Prod. Div.
600 E. 2nd St., Los Angeles, Calif.
BRANCH OFFICES:
1957 E. 71st St., Chicago, Ill.
418 Boylston St., Boston, Mass.
110 W. Madison, Kirkwood, Mo.
972 Broad St., Newark, N.J.
1010 Euclid Ave., Cleveland, Ohio
DISTRIBUTORS:
Noland Co., Inc., 2204 First Ave. S., Birmingham, Ala.
Noland Co., Inc., 9th & Gardner St., Gadsden, Ala.
Safety Engineering & Supply Co., 915 N. First St., Phoenix, Ariz.
Fire Appliance & Safety Co., 1114 W. Markham, Little Rock, Ark.
Hawkins-Hawkins Co., Inc., 1255 Eastshore Hwy., Berkeley, Calif.
McDonald, B. F., Co., 5721 W. 96th St., Los Angeles, Calif.
Curtis, L. N., & Sons, 5814 College St., Oakland, Calif.
Bailey Equip. Co., 1604 State St., San Diego, Calif.
Brenton Equip. Co., 374 Brannan St., San Francisco, Calif.
Refrigeration Machinery Corp., 1030 E. Anaheim, Wilmington, Calif.
Safety Equip. Co., 1630 - 17th St., Denver, Colo.
Calamaredes, Mike, 40 George St., Bristol, Conn.
Noland Co., Inc., 136 K. St. N.E., Washington, D.C.
Noland Co., Inc., 929 East Bay St., Jacksonville, Fla.
Noland Co., Inc., Meridian & Washington, Tampa, Fla.
Safety Equip. Supply Co., 104 S. King St., La Grange, Ga.
Aurora Fire Protection Co., 728 - 4th Ave., Aurora, Ill.
Adams-Best Co., 915 W. North Ave., Chicago, Ill.
Capitol Fire Equip. Co., 2246 E. 73rd St., Chicago, Ill.
Great Lakes Supply Corp., 1026 W. 50th St., Chicago, Ill.
Standard Safety Equip. Co., 232 W. Ontario St., Chicago, Ill.
Midwest Fire & Safety Equip. Co., 41 Pennsylvania, Evansville, Ind.
Carmichael Sign Co., 102 N. College Ave., Indianapolis, Ind.
Midwest Fire & Safety Equip. Co., 1605 Prospect St., Indianapolis, Ind.
Weisberger Bros. Paper Co., 1831 So. Main St., South Bend, Ind.
Iowa Safety Equip. Co., 414 - 12th St., Des Moines, Iowa
Schmitt, Robert L., Co., 306 E. Main St., Louisville, Ky.
Davis Emergency Equip. Co. of N.E., 136 W. Emerson St., Melrose, Mass.
Bankie Supply Co., 2944 Woodward Ave., Detroit, Mich.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Factory Supply Co., 1636 Terrance St., Muskegon, Mich.
Mars, W.P. & R.S., Co., 322 W. Michigan St., Duluth, Minn.
Elvin First Aid Supply, 327 - 2nd Ave. No., Minneapolis, Minn.
Noland Co., Inc., 204 W. Fortification St., Jackson, Miss.
Reis Equip. Co., 1417 Tower Grove Ave., St. Louis, Mo.
New Jersey Safety Equip. Co., 299 Park Ave., East Orange, N.J.
Notte Safety Appliances Co., 308 Main St., East Orange, N.J.
Gebler Supply Co., P.O. Box 739, Binghamton, N.Y.
Operational Radar Service, 11 Broadway, New York City, N.Y.
Rochester Safety Equip. Co., 83 Howell St., Rochester, N.Y.
Burns Supply, Inc., 760 W. Genesee St., Syracuse, N.Y.
Syracuse Supply Co., 314 W. Fayette St., Syracuse, N.Y.
Noland Co., Inc., 206 S. West Street, Raleigh, N.C.
Safety Clothing & Equip. Co., 1990 E. 69th St., Cleveland, Ohio
Standard Safety Equip. Co., 855 E. 152nd St., Cleveland, Ohio
Somers, Fittler & Todd Co., 3795 Oakwood Ave., Youngstown, Ohio
Pendergast, Albert W., Safety Equip. Co., 6913 Tulip St., Philadelphia, Pa.
Somers, Fittler & Todd Co., 325 Fort Pitt Blvd., Pittsburgh, Pa.
Noland Co., Inc., 2026 Meeting St., Charleston, S.C.
Noland Co., Inc., 357 Court Ave., Memphis, Tenn.
Noland Co., Inc., 1st & Main Sts., Nashville, Tenn.
Radcliffe Supply Co., 115 Polk St., Amarillo, Tex.
Settle Safety Supply Co., Box 9631, Dallas, Texas
Hughes, David L., 7002 Navigation Blvd., Houston, Texas
Universal Safety & Fire Equip. Co., 727 S.W. Temple, Salt Lake City, Utah
Noland Co., Inc., 604 Henry Ave., Charlottesville, Va.
Noland Co., Inc., 122 S. 8th St., Richmond, Va.
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Spokane Safety Appliance Co., N. 719 Division, Spokane, Wash.
Industrial Safety Supply Co., 5518 MacCorkle Ave., Charleston, W. Va.
Pagel Safety Products, 4611 W. National Ave., Milwaukee, Wis.
Levitt Safety Ltd., 889 Westminster Ave., Winnipeg, Manitoba, Canada
Levitt-Safety Ltd., 747 Vaughan Rd., Toronto, Ontario, Canada
Levitt-Safety Ltd., 4205 Courtral Ave., Montreal, Quebec, Canada

Westinghouse Electric Corp.
Sturtevant Div.—Hyde Pk., Boston 36, Mass.
BRANCH OFFICES:
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600 St. Paul Ave., Los Angeles, Calif.
410 Bush St., San Francisco, Calif.
910 15th St., Denver, Colo.
36 Pearl St., Hartford, Conn.
1625 K. St., N.W., Washington, D.C.
1299 Northside Dr., N.W., Atlanta, Ga.
Mdse. Mart Plaza, Chicago, Ill.
1566 Stadium Dr., Indianapolis, Ind.
2515 Dean Ave., Des Moines, Ia.
Godchaux Bldg., New Orleans, La.
501 St. Paul Plaza, Baltimore, Md.
10 High St., Boston, Mass.
5757 Trumbull Ave., Detroit, Mich.
123 E. Grant St., Minneapolis, Minn. (Agent)
101 W. 11th St., Kansas City, Mo.
411 No. Seventh St., St. Louis, Mo.
1060 Broad St., Newark, N.J.
106 Amherst, N.E., Albuquerque, N. Mex.
830 Ellicott Sq. Bldg., Buffalo, N.Y.
420 Lexington Ave., New York, N.Y.
700 W. Genesee St., Syracuse, N.Y.
210 E. Sixth St., Charlotte, N.C.
707 Guilford Bldg., Greensboro, N.C.
106 S. Main St., Akron, Ohio
630 Vine St., Cincinnati, Ohio
1365 Ontario St., Cleveland, Ohio
262 N. 4th Ave., Columbus, Ohio

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306 4th Ave. Union Bk. Bldg., Pittsburgh, Pa.
524 Court St., Reading, Pa.
51 Empire St., Providence, R.I.
1608 Canton St., Dallas, Tex.
312 E. Missouri St., El Paso, Tex. (Agent)
507 Dallas Ave., Houston, Tex.
1110 E. Main St., Richmond, Va.
1338 Fourth Ave., Seattle, Wash.
407 People's Bldg., Charleston, W. Va.
538 N. Broadway, Milwaukee, Wis.

Wheelabrator Corp.
512 S. Byrkit St., Mishawaka, Ind.

BRANCH OFFICES:

800 Farley Bldg., Birmingham, Ala.
3155 Leonis Blvd., P.O. Box 15442, Los Angeles, Calif.
852 Laurel St., P.O. Box 131, San Carlos, Calif.
2406 W. Lunt Ave., Chicago, Ill.
500 S. Byrkit St., Mishawaka, Ind.
497 Summer Ave., at the "X"—Suite 1, Springfield, Mass.
13504 Fenkell Ave., Detroit, Mich.
201 S. Central Ave., Rm. 107, Jacy Bldg., St. Louis, Mo.
53 Newark St., Bldg., Hoboken, N.J.
1067 Broadway, Buffalo, N.Y.
211 W. Sycamore, Greensboro, N.C.
Rm. 609 American Bldg., Cincinnati, Ohio
10111 Euclid Ave., Suite 217, Heather Bldg., Cleveland, Ohio
629 Bethlehem Pike, Philadelphia, Pa.
No. 1 Cedar Blvd., Pittsburgh, Pa.
706 Garden Oaks Blvd., P.O. Box 10196, Houston, Tex.
79 S. Main St., 615 Deseret Bldg., Salt Lake City, Utah
114 Broadway, N., Seattle, Wash.
2498 Yonge St., Rm. 9, Toronto, Ont., Can.

Wheeler Protective Apparel, Inc. 141
224 W. Huron St., Chicago 10, Ill.

DISTRIBUTORS:

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Safety Engr. & Supply Co., P.O. Box 111, Mobile, Ala.
Arizona Welding Equip. Co., 415 S. Seventh St., Phoenix, Ariz.
Aweco Supply Co., 800 S. Park Ave., Tucson, Ariz.
Bullard, E. D., Co., 6719 S. Figueroa St., Los Angeles, Calif.
Bullard, E. D., Co., 2680 Bridgeway, Sausalito (San Francisco), Calif.
Industrial Safety Equip. Co., 574 New Park Ave., West Hartford, Conn.
Prot. Equip. Inc., 634 Orleans St., Chicago, Ill.
Prot. Equip. Inc., 3231 25th St., Rock Island, Ill.
Kinsey, E. A., Co., The, 1550 Stadium Dr., Indianapolis, Ind.
Mid-Continent Transmission & Supply, Inc., 2027 N. Broadway, Wichita, Kans.
Schmitt, Robert L., Co., 306 E. Main St., Louisville, Ky.
Guardian Safety Equip. Co., 3615 Capitol Heights Ave., Baton Rouge, La.
Cutter, Wood & Sanderson Co., 222 Third St., Cambridge, Mass.
Strelinger, Charles A., 149 E. Larned St., Detroit, Mich.
Mars, W.P. & R.B., Co., 322 W. Michigan St., Duluth, Minn.
Safety Inc., 17½ E. 31st St., Kansas City, Mo.
Safety Inc., 2608 Olive St., St. Louis, Mo.
Guardian Safety Equip. Co., 400 S. Jefferson St., Orange, N.J.
Elwood Co., The, 2180 Elmwood, Buffalo, N.Y.
Syracuse Supply Co., 314 W. Fayette St., Syracuse, N.Y.
Safety First Supply Co., 4251 W. 35th St., Cleveland, Ohio
Dayton Safety Supply, 11 Longworth St., Dayton, Ohio
Safety First Supply Co., 858 W. Delaware Ave., Toledo, Ohio
Sanderson Safety Supply Co., 816 Southeast Hawthorne, Portland, Ore.
Guardian Safety Equip. Co., 214 S. 45th St., Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Safety Equip. Distrg., 832 W. Main St., Knoxville, Tenn.
Engineering Supply Co., 6000 Denton Dr., Dallas, Tex.
Guardian Safety Equip. Co., 1915 Westheimer, Houston, Tex.
Industrial Supply Co., Inc., 131 Social Hall Ave., Salt Lake City, Utah
Safety & Supply Co., 115 Blanchard St., Seattle, Wash.
Spokane Safety Appliance, 219 N. Division, Spokane, Wash.
Safety First Supply Co., P.O. Box 1007, Charleston, W. Va.
Safety First Supply Co., 1 Garland Ave., Wheeling, W. Va.
Protective Equip. Inc., 2001 W. Capitol Dr., Milwaukee, Wis.

Wickman Glove Co.
1824 San Pablo Ave., Berkeley 2, Calif.

Wickwire Spencer Steel Div. 203
Colorado Fuel & Iron Corp.
575 Madison Ave., N. Y., N. Y.

Wiesman Mfg. Co. 226
31 S. St. Clair St., Dayton 2, Ohio

Wilkins Co., Inc. 127
248 Groton Ave., Cortland 1, N. Y.

Williams Jewelry & Mfg. Co. 285
10 S. Wabash Ave., Chicago 3, Ill.

Willson Products, Div., Ray-O-Vac Co. ..111
205 Washington St., Reading, Pa.

BRANCH OFFICES:

Safety Engr. & Supply Co., Inc., P.O. Box 111, Mobile, Ala.
Bullard, E. D., Co., 6719 S. Figueroa St., Los Angeles, Calif.
Cameron & Barkley Co., 605 E. Forsyth St., Jacksonville, Fla.
Cameron & Barkley Co., 727 N. West First Ave., Miami, Fla.
Cameron & Barkley Co., P.O. Box 2748, Orlando, Fla.
Cameron & Barkley Co., 107 S. Franklin St., Tampa, Fla.
Cameron & Barkley Co., P.O. Box 1067, Savannah, Ga.
Safety Services, Inc., 1034 Fuller Ave., S.E., Grand Rapids, Mich.
Montana Hardware Co., P.O. Box 1219, Great Falls, Mont.
Syracuse Supply Co., 76 Wall St., Binghamton, N.Y.
Syracuse Supply Co., Seaway Div., Curtis Ave. & South St., Massena, N.Y.
Syracuse Supply Co., Intercity Div., Curry Rd., P.O. Box 447, Schenectady, N.Y.
Syracuse Supply Co., 314-332 W. Fayette St., Syracuse, N.Y.
Smith-Courtney Co., P.O. Box 926, Greensboro, N.C.
Smith-Courtney Co., P.O. Box 2448, Hickory, N.C.
Kinsey, E. A., Co., Inc., 1020 W. Fifth Ave., Columbus, Ohio
Kinsey, E. A., Co., Inc., 16 Washington St., Dayton, Ohio
Williams, David L., P.O. Box 5155, Akron, O.
Safety First Supply Co., 858 W. Delaware Ave., Toledo, Ohio
Safety First Supply Co., 4251 W. 35th St., Cleveland, Ohio
Engineering Supply Co., 1124 E. 4th St., Tulsa, Okla.
Plowden Supply Co., 720 Franklin St., Beaumont, Texas.
Bradley Industrial Supply Co., Pampa, Texas
Haseltine, J. E., & Co., 510 First Ave., S., Seattle, Wash.
Haseltine, J. E., & Co., 1101 N. Division St., Spokane, Wash.
Safety First Supply Co., 1594 Jackson St., Charleston, W. Va.
Safety First Supply Co., No. 1 Garland Ave., Wheeling, W. Va.

DISTRIBUTORS:

Safety Engr. & Supply Co., Inc., 617 N. 10th St., Birmingham, Ala.
Brenton Equip. Co., 374 Brenton St., San Francisco, Calif.
Bullard, E. D., Co., 275 Eighth St., San Francisco, Calif.
Guardian Safety Equip. Co., 7223 S. Main St., Los Angeles, Calif.
Henrite & Bolthoff Co., 1635 17th St., Denver, Colo.
Industrial Safety Supply Co., 574 New Park Ave., West Hartford, Conn.
Protective Equip. Co., 634 Orleans St., Chicago, Ill.
Kinsey, E. A., Co., 1550 Stadium Dr., Indianapolis, Ind.
Pittenger & Davis, Inc., 911 E. Third St., Wichita, Kans.
Stone, L. R., Supply Co., 405 N. 6th St., Kansas City, Kans.
Neill-LaVielle Supply Co., 2211 S. Brook St., Louisville, Ky.
Orr Safety Equip. Co., 300 E. Main St., Louisville, Ky.
Woodward, Wight & Co., Ltd., P.O. Box 370, 451 Howard Ave., New Orleans, La.
Carey Machinery & Supply Co., 2501-07 Brehm's Lane, Baltimore, Md.
Lewis, Chas. C., Co., 209 Page Blvd., Springfield, Mass.
Cutter, Wood & Sanderson Co., 222 Third St., Cambridge, Mass.
Blake, Geo. P., Co., 198 Mechanic St., Worcester, Mass.
Safety Services, Inc., 1903 W. Main St., Kalamazoo, Mich.
Strelinger, Chas. A., Co., 149 E. Larned St., Detroit, Mich.
Farwell, Ozmun, Kirk & Co., 2nd & Jackson St., St. Paul, Minn.
Sligo, Inc., 1301 N. Sixth St., St. Louis, Mo.
Montana Hardware Co., 823 S. Montana St., Butte, Mont.
Interstate Machinery & Supply Co., 1606 Douglas St., Omaha, Nebr.
American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.
Smith, W. L., Co., 165 Broadway, Newburgh, N.Y.
Syracuse Supply Co., 314-332 W. Fayette St., Syracuse, N.Y.
Troy Belting & Supply Co., 6 & 8 Grand St., Troy, N.Y.
Wilson, W. S., Corp., 47-50 38th St., Long Island City, N.Y.
Kinsey, E. A., Co., Inc., 331 W. Fourth St., Cincinnati, Ohio
Hart Industrial Supply Co., 726 W. Grand Ave., Oklahoma City, Okla.
Krisman Industrial Supply Co., 308 E. Fourth St., Tulsa, Okla.
Haseltine, J. E., & Co., 115 S.W. Second Ave., Portland, Ore.
Industrial Products Co., 2850 N. 4th St., Philadelphia, Pa.
Pendergast, Albert W., Safety Equip. Co., 6913 Tulip St., Philadelphia, Pa.
Potter, L. B., & Co., 603 W. Lackawanna Ave., Scranton, Pa.
Quaker City Railroad Sales Co., Phila. National Bank, Philadelphia, Pa.
Safety First Supply Co., 425 Magee St., Pittsburgh, Pa.
Tierney, James E., 131 Washington St., Providence, R.I.
Carolina Supply Co., 35 W. Court St., Greenville, S.C.
Cameron & Barkley Co., 160 Meeting St., Charleston, S.C.
Clement Safety Equip. Inc., 720 S. Third St., Memphis, Tenn.
Genter, C. D., Co., 2109-13 Broad St., Chattanooga, Tenn.
Mine & Smelter Supply Co., 1515—11th St., El Paso, Tex.
Plowden Supply Co., 6300 Navigation Blvd., Houston, Tex.
Southwest Equip. & Extinguisher Co., 526 Palm Drive, Corpus Christi, Tex.
Allied Safety Equip. Co., 452-62 M & M Bldg., Houston, Tex.
Bradley Industrial Supply Co., 328 E. 3rd St., Borger, Tex.
Engineering Supply Co., 6000 Denton Drive, Dallas, Tex.
Industrial Supply Co., Inc., 121-135 Social Hall Ave., Salt Lake City, Utah
Casper Supply Co., 444-448 S. Center St., Casper, Wyo.

Wilmington Plastics Co.
810 S. Heald St., Wilmington 99, Del.

Wilson Rubber Co.
1200 Garfield Ave., S.W., Canton 6, Ohio

Wind-Kor Automatic Safety Device Co.
3960 Elston Ave., Chicago 18, Ill.

Wire Rope Corp. of America 192
2nd & Isadore, St. Joseph, Mo.

BRANCH OFFICES:

370 Tenth St., San Francisco, Calif.
3649 E. 40th Ave., Denver, Colo.
375 Washington Ave., North Haven, Conn.
665 8th St., N.W., Atlanta, Ga.
2452 N. Greenview St., Chicago, Ill.
1949 Lafayette St., New Orleans, La.
467 Montgomery St., Shreveport, La.
282 Border St., Boston, Mass.
1705 W. Lafayette St., Detroit, Mich.
3006 Hatherly Drive, St. Louis, Mo.
940 Hertel Ave., Buffalo, N.Y.
105 Hudson St., New York, N.Y.
1025 Depot St., Cincinnati, Ohio
3170 W. 33rd St., Cleveland, Ohio
202 East Brady St., Tulsa, Okla.
2221 N.W. Thurman St., Portland, Ore.
850 North Watts St., Philadelphia, Pa.
1004 Washington Blvd., Pittsburgh, Pa.
257 E. Georgia Ave., Memphis, Tenn.
715 N. Fifth St., Abilene, Texas
1700 Ingeborg St., Houston, Texas
Andrews Highway, Odessa, Texas
1104 Main St., Charleston, W. Va.

Witt Cornice Co.
2118 Winchell Ave., Cincinnati 14, Ohio

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622 N. Water St., Milwaukee 2, Wis.

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Wolverine Shoe & Tanning Corp.
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Wrisley, Allen B., Co.
347 Fifth Ave., New York, N. Y.

Wyandotte Chemicals Corp. 41
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BRANCH OFFICES:

8921 Dice Rd., Los Nietos, Calif.
46 Fifth St., N.E., Atlanta, Ga.
540 N. Michigan Ave., Chicago, Ill.
1113 Statler Bldg., Boston, Mass.
1120 Dime Bldg., Detroit, Mich.
903 Wesley Temple Bldg., Minneapolis, Minn.
345 Law Bldg., 1207 Grand Ave., Kansas City, Mo.
4227 Lindell Blvd., St. Louis, Mo.
604 Lafayette Bldg., Broadway & Washington Sts., Buffalo, N.Y.
1475 Broadway, New York, N.Y.
509-A Dixie Terminal Bldg., Cincinnati, Ohio
1116-1010 Euclid Bldg., Cleveland, Ohio
200 Wilford Bldg., 33rd & Arch Sts., Philadelphia, Pa.
3409 Oaklawn, Dallas, Texas
659 Skinner Bldg., Seattle, Wash.
997 Decarie Blvd., Ville St. Laurent, Montreal, Quebec, Can.

Please mention National Safety News when contacting any of these organizations.

classified safety product index

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Abrasives

American Abrasive Metals Co.
Bausch & Lomb Optical Co.
DeWalt, Inc.
Ideal Industries, Inc.
Pittsburgh Plate Glass Co.
Scheer Co. Inc.,
Scientific Industrial Supply Co., Inc.
Tamms Industries, Inc.
Wheelabrator Corp.

Abrasive Floor Plate, Steel

Alan Wood Steel Co.
American Abrasive Metals Co.
Brabrook, A. N., Inc.

Absorbent, Oil and Grease

Canfield Oil Co.
Cottentex Products Co.
Dameron Enterprises, Inc.
Diversey Corp.
Dri-Rite Co
Eagle-Picher Co.
Finnell System, Inc.
Flor-Dry Co.
Huntington Laboratories, Inc.
Industrial Products Co.
Legge, Walter G., Co., Inc.
Oil-Dri Corp. of America
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Speedi-Dri Corp.
Surety Mfg. Co.
Waverly Petroleum Products Co.
Wyandotte Chemicals Corp.

Accident Prevention Service

Loss Control Associates
National Safety Council
Porto-Clinic Instruments, Inc.
Safety Clothing & Equipment Co.
U. S. Safety Service Co.

Acid Handling Utensils

American Allsafe Co., Inc.
Fisher Scientific Co.
Frommelt Industries
General Scientific Equipment Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Industrial Products Co.
McDonald, B. F., Co.
Miller Products Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equip. Corp.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.

Adhesive Plaster

Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Air Blast Valves

Littell, F. J., Machine Co.
Schrader's, A., Son Div. of Scovill Mfg. Co., Inc.

Air Compressors

Acme Protection Equipment Co.
Cornelius Co.
DeVilbiss Co.
Ingersoll-Rand Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Moore, John B., Corp.
Tokheim Corp.

Air Ejectors

Ingersoll-Rand Co.
Littell, F. J., Machine Co.
Pyle-National Co.
Schrader's, A., Son Div. of Scovill Mfg Co., Inc.

Air Filters

Allied Witan Co., Inc.
Bullard, E. D., Co.
Coppus Engineering Corp.
DeVilbiss Co.
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Johnson-March Corp.
Karel First Aid Supply Co.
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Westinghouse Electric Corp., Sturtevant Div. - Hyde Park
Willson Products, Inc.

Air Pollution Control

Aerotec Corp., The
Davis Emergency Equipment Co., Inc.
Johnson-March Corp.
Kruger, Harold, Instruments
Mine Safety Appliances Co.
Oxy-Catalyst, Inc.
Schneible, Claude B., Co.
Taller & Cooper, Inc.
Trane Co.

Alarms, Air Raid

DuKane Corp.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Gamewell Co.

Alarms, Carbon Monoxide

Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Taller & Cooper, Inc.

Alarms, Combustible Gas

Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
Johnson-Williams, Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Safety First Supply Co.
Taller & Cooper, Inc.

Alarms, Fire

"Automatic" Sprinkler Corp., of America
Du Kane Corp.
Electronics Corp. of America
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fenwal, Inc.
Gamewell Co.
Grinnell Co., Inc.
Kidde, Walter, & Co., Inc.
Notifier Corp.
Pyrene C-O-Two Div. The Fyr-Fyter Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Sperti Faraday, Inc.
Standard Electric Time Co.
Sterling Siren Fire Alarm Co., Inc.
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Alarms, Intrusion

Electronic Control Corp.
Electronics Corp. of America
Gamewell Co.
Kidde, Walter, & Co., Inc.

Alarms, Smoke

Cardox Corp.
Davis Emergency Equip. Co., Inc.
Electronic Control Corp.
Electronics Corp. of America
Kidde, Walter, & Co., Inc.
New Jersey Safety Equip. Co.
Searjeant Metal Products Co.
Taller & Cooper, Inc.

Ambulance Auxiliary

Bomgardner Mfg. Co.

Anemometers

Fisher Scientific Co.
Mine Safety Appliances Co.
Safety First Supply Co.
Willson Products, Inc.

Anti-Fogging Compounds for Goggles

Acme Protection Equipment Co.
American Optical Co.
Associated Just Distributors, Inc.
Bausch & Lomb Optical Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Carhoff Co.
Davis Emergency Equipment Co., Inc.
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Industrial Products Co.
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Mine Safety Appliances Co.
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Quickee Products, Inc.
Safety Clothing & Equipment Co.
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Silicone Paper Co. of America, Inc.
U. S. Safety Service Co.
Wilkins Co., Inc.
Willson Products, Inc.

Anti-Fogging Cloth for Glasses, Windshields (Anti-Fogging Compounds)

Bullard, E. D.
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Pulmosan Safety Equip. Corp.
Safety Clothing & Equipment Co.
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Antiseptics

American Optical Co.
Brenton Equip. Co.
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Chesebrough Mfg. Co.
Davis Emergency Equipment Co.
Halperin, A. E., Co., Inc.
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Karel First Aid Supply Co.
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McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
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Searjeant Metal Products, Inc.

Aprons

Advance Glove Mfg. Co.
Allay Mfg. Co.
Allied Glove Corp.
American Allsafe Co., Inc.
American Optical Co.
Associated Bag & Apron Co.
Bowman, George H., Jr.
Boyer-Campbell Co.
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Brossard, Lester L., Co.
Buhrke, R. H., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Chem-Wear, Inc.
Chicago Eye Shield Co.
Davids Gloves, Inc.
Davis Emergency Equipment Co.
Dunn Products
Eastern Safety Equipment Co.
Erell Mfg. Co.
Far-Ex Corp.
Fibre-Metal Products Co.
Fisher Scientific Co.
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
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Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
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New Jersey Safety Equipment Co.
Olympic Glove Co., Inc., The
Pioneer Rubber Co.
Plasco Safety Products Co.
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Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer, H. M., & Son Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Tower, A. J., Co.
U. S. Safety Service Co.
West Disinfecting Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Arresters, Flame

New Jersey Safety Equipment Co.
Protectoseal Co., The

Artificial Respirator Trainer

Karel First Aid Supply Co.
Mine Safety Appliances Co.
Safety First Supply Co.

Ash Trays, Industrial

Safety Floor Products

Athlete's Foot Retardant

Associated Just Distribution, Inc.
Brabrook, A. N., Inc.
Dameron Enterprises, Inc.
Dolge, C. B., Co.
Fuld Bros., Inc.
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Karel First Aid Supply Co.
McDonald, B. F., Co.
Midland Laboratories
Onox, Inc.
Safety Clothing & Equipment Co.
Sani-Mist Inc.
West Disinfecting Co.

Audiometer

Ambco, Inc.
Audivox, Inc.
Beltone Hearing Aid Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
Maico Co., The, Inc.

Audiometric Testing Rooms

Industrial Acoustics Co., Inc.
Industrial Sound Control, Inc.
Karel First Aid Supply Co.
Maico Co., The, Inc.

Audio Vendor

Cousino, Inc.

Automobile Safety Belts (Belts, Safety)

Auto-Crat Mfg. Co.
Boyer-Campbell Co., The
Brown-Line Co.
Bullard, E. D., Co.
Central Safety Equip. Co.
General Textile Mills, Inc.
Halperin, A. E., Co., Inc.
Hickok Mfg. Co.
Industrial Products Co.
McDonald, B. F., Co.
McJohn Corp.
Miller Equipment Co., Inc.

See directory of Safety Equipment Sources for addresses.

Radiant Mfg. Co.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Stebco Mfg. Co.

Awards, Prize

Award Incentives, Inc.
Falcon Alarm Co., Inc.
Halperin, A. E., Co., Inc.
Hamilton Watch Co.
Hornik, Frederick
House of Williams
Metal Arts Co., Inc.
National Safety Council
Organization Services, Inc.
Williams Jewelry & Mfg. Co.

B

Badges and Buttons

Award Incentives, Inc.
House of Williams
Matthews, Jas. H., & Co.
Metal Arts Co., Inc.
National Safety Council
New Jersey Safety Equip. Co.
Organization Services, Inc.
Ready Made Sign Co., Inc.
Williams Jewelry & Mfg. Co.

Bags, Linemen's Glove

Aljay Mfg. Co., Inc.
Allied Glove Co.
Bashlin, W. M., Co.
Brenton Equip. Co.
Buhrke, R. H., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davis Emergency Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Klein, Mathias, & Sons
McDonald, B. F., Co.
Miller Equipment Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Salisbury, W. H., & Co.
Scientific Industrial Supply Co., Inc.

Bags, Linemen's Sleeve

Buhrke, R. H., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Dorsey, John E., Co.
General Scientific Equipment Co.
Industrial Gloves Co.
Industrial Products Co.
Miller Equipment Co., Inc.
Pulmosan Safety Equipment Corp.
Scientific Industrial Supply Co., Inc.
Salisbury, W. H., & Co.
Sawyer Safety Products Co.

Bags, Linemen's Tool

Bashlin, W. M., Co.
Brenton Equip. Co.
Buhrke, R. H., Co.
Bullard, E. D., Co.
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Davis Emergency Equipment Co.
General Scientific Equipment Co.
Industrial Gloves Co.
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Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
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Sawyer Safety Products Co.

Bandages, First Aid

Aloe, A. S., Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co.
General Bandage, Inc.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Safety Belt Co.
Karel First Aid Supply Co.
Kip Inc.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.

Barrel Lifters

Economy Engineering Co.
General Machine & Welding Works, Inc.
Industrial Products Co.
Kensico Mfg. Co., Inc.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Barrel and Drum Movers

General Machine & W. W. Inc.
Industrial Products Co.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Barrel Stands

Economy Engineering Co.
General Scientific Equipment Co.
Huntington Laboratories, Inc.
Industrial Products Co.
Miller Products Co., Inc.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Batteries

Dual-Lite Co.
Exide Industrial Div., Electric Storage Battery Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Nickel Cadmium Battery Corp.

Belt Dressing

Allen, W. D., Mfg. Co.
Davis Emergency Equipment Co.
Halperin, A. E., Co., Inc.
McDonald, B. F., Co.
Safety First Supply Co.

Belt Shifters

Safety First Supply Co.
Surty Mfg. Co.

Belt Shock Absorbers

Brenton Equip. Co.
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Miller Equipment Co.
Rose Mfg. Co.
Safety First Supply Co.

Belts, Linemen's

Bashlin, W. M., Co.
Boyer-Campbell Co., The
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Buhrke, R. H., Co.
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Central Safety Equipment Co.
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Klein, Mathias, & Sons
McDonald, B. F., Co.
Miller Equipment Co.
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Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sebrell, J. B., Corp.
Seco Safety Products Co.
Standard Glove Co.

Belts, Safety

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Buhrke, R. H., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co., Inc.
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Halperin, A. E., Co., Inc.
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Rose Mfg. Co.
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Sawyer Safety Products Co.
Sebrell, J. B., Corp.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.

Beryllium Non Sparking Tools

Beryllium Corp.
Boyer-Campbell Co., The
General Scientific Equipment Co.
McDonald, B. F., Co.
Pulmosan Safety Equipment Corp.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co.

Bins, Towel

Karel First Aid Supply Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Polis, J. D., Mfg. Co.
Protectoseal Co., The

Blankets, Fireproofed

Advance Glove Mfg. Co.
Aljay Mfg. Co., Inc.
Allied Glove Co.
American Allsafe Co., Inc.
Associated Bag & Apron Co.
Boyer-Campbell Co., The
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Bullard, E. D., Co.
Central Safety Equipment Co.
Cotton Goods Mfg. Co.
Davis Emergency Equipment Co., Inc.
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Fisher Scientific Co.
Frommelt Industries
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Halperin, A. E., Co., Inc.
Holcomb Safety Garment Co.
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Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Blankets, Linemen's Rubber

Boyer-Campbell Co., The
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Central Safety Equipment Co.
Charleston Rubber Co.
General Scientific Equipment Co.
Industrial Products Co.
McDonald, B. F., Co.
Miller Products Co., Inc.
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Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.
Scientific Industrial Supply Co., Inc.

Blankets, Linemen's Vinyl Plastic

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Blankets, Wool Safety

Allied Glove Co.
American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co.
Eastern Safety Equipment Co.
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Junkin Safety Appliances Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
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Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Blast Furnace Equipment

Bailey, William M., Co.
Ingersoll-Rand Co.
Reliance Steel Products Co.

Blocks, Truck Wheel

Brenton Equip. Co.
Calumet Steel Castings Corp.
General Scientific Equip. Co.
New Jersey Safety Equip. Co.

Blockers, Mine Car

General Scientific Equip. Co.
Safety First Supply Co.

Blockers, Railroad Car

General Scientific Equip. Co.
Industrial Products Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Blowers, Hose Mask

Acme Protection Equipment Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Blowers, Portable, Electric

Clarke Sanding Machine Co.
Coppus Engineering Corp.
Doyle Vacuum Cleaner Co.
General Blower Co.
Hild Floor Machine Co., Inc.
Huntington Laboratories, Inc.
Ideal Industries, Inc.
McDonald, B. F. Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Safety First Supply Co.

Blowers, Ventilating

Coppus Engineering Corp.
Davis Emergency Equip. Co.
General Blower Co.
Ingersoll-Rand Co.
McDonald, B. F., Co.

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Mine Safety Appliances Co.
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Ruemelin Mfg. Co.
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Boards, Changeable Letter

Boyer-Campbell Co., The
Davenport, A. C., and Son, Inc.
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Kennedy-Ingalls, V. E., Co.
New Jersey Safety Equipment Co.
Prairie State Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Wagner Sign Service, Inc.

Books on Safety

Falcon Alarm Co., Inc.
Fisher Scientific Co.
Loss Control Associates
National Safety Council
Ready Made Sign Co., Inc.

Boots, Linemen's

Allied Glove Co.
Bashlin, W. M., Co.
Dorsey, John E., Co.
Goodyear Industrial Products Co., Inc.
Hy-Test Safety Shoes, Div.
International Shoe Co.
Miller Products Co., Inc.
Pulmosan Safety Equipment Corp.
Record Industrial Company
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Wolverine Shoe & Tanning Corp.

Boots, Rubber

Allied Glove Co.
American-La-France Corp.
Beacon Falls Rubber Footwear
Boyer-Campbell Co., The
Brenton Equip. Co.
Davids Gloves, Inc.
Dorsey, John E., Co.
Dunn Products
Genter, C. D., Co.
Industrial Products Co.
Iron Age Safety Shoes
Lehigh Safety Shoe Co.
McDonald, B. F., Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
U. S. Rubber Co.

Boots, Safety Toe

Hy-Test Safety Shoes, Div.
International Shoe Co.
Industrial Products Co.
Iron Age Safety Shoes
McDonald, B. F., Co.
Mine Safety Appliance Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equip. Co.
Scientific Industrial Supply Co., Inc.

Boots, Wooden Sole

Allied Glove Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.

Border Line Tape

Chart-Pak, Inc.

Bottle Carrier

Benson & Associates
Brenton Equip. Co.
Central Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.

Breathing Apparatus, Air Supplied

Acme Protection Equipment Co.
American LaFrance Corp.
Bomgardner Mfg. Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co.
Dorkson, Corp.
Genter, C. D., Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.

Buckets, Hoisting

Bashlin, W. M., Co.
Bil-Jax, Inc.
Bubrke, R. H., Co.
Industrial Products Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Buckets, Rubber

Brenton Equip. Co.
Dunn Products
Fisher Scientific Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
McDonald, B. F., Co.
Miller Products Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.

Bulletin Boards

American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Davenport, A. C., & Son, Inc.
Elliott Service Co., Inc.
General Scientific Equip. Co.
Industrial Products Co.
Matthews, Jas. H., & Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
National Safety Council - Part 2
New Jersey Safety Equipment Co.
Prairie State Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.

Burn Ointments

Kip, Inc.

Burners, Gas

Coppus Engineering Corp.
Fisher Scientific Co.
Karel First Aid Supply Co.

C

Cabinets, Towel

Carey, Philip, Mfg. Co.
Huntington Laboratories, Inc.
Protectoseal Co.
West Disinfecting Co.

Cable Clamps

Bethlehem Steel Corp.
Genter, C. D., Co.
Jackson Products
Laughlin, Thomas, Div., American Hoist & Derrick Co.
Newman Mfg. & Sales Co.
Union Wire Rope Corp.

Cable Clamps—Sealing Grips

Pyle-National Co.

Cable Connector

Ericson Mfg. Co.
Genter, C. D., Co.
Jackson Products
Pyle-National Company
United Cable Corp.

Cable Tester

Mine Safety Appliances Co.

Cable Wire

American Chain & Cable Co.
Bethlehem Steel Co.
Diamond Wire & Cable Co.
Genter, C. D., Co.
Jones & Laughlin Steel Corp.
Macwhyte Co.
Union Wire Rope Corp.

Cans, Safety

Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equip. Co.
Dameron Enterprises, Inc.
Eagle Mfg. Co.
Fisher Scientific Co.
Franklin, Bernard, Co., Inc.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Products Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Polls, J. D., Mfg. Co.
Protectoseal Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Witt Cornice Co.

Canvas, Fireproofed

Advance Glove Mfg. Co.
Allay Mfg. Co., Inc.
Allied Glove Co.
Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Central Safety Equipment Co.
Eastern Safety Equip. Co.
Frommelt Industries
General Scientific Equip. Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Miller Products Co., Inc.
Racine Glove Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Wheeler Protective Apparel, Inc.

Caps for Women

Allied Glove Co.
Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Chic-Maid Hat Mfg. Co.
Eastern Safety Equipment Co.
Genter, C. D., Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
New Era Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.

Car, Hopper Closer

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Industrial Products Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Trumbull Mfg. Co.

Car Door Opener

American Allsafe Co., Inc.
Boyer-Campbell Co., The
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Carboy Drainer

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Safety Equipment Co.

Carboys, Plastic

Fisher Scientific Co.
New Jersey Safety Equipment Co.

Carboy Tilter

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Economy Engineering Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Goodyear Industrial Products Co., Inc.
Industrial Products Co.
Miller Products Co., Inc.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Standard Safety Equipment Co.

Carboy Truck

Boyer-Campbell Co., The
General Scientific Equipment Co.
Industrial Products Co.
Karel First Aid Supply Co.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

See directory of Safety Equipment Sources for addresses.

classified safety product index

Carrier, Bottle

Benson & Associates
Brenton Equip. Co.
Central Safety Equipment Co.
Fisher Scientific Co.
Karel First Aid Supply Co.
Morse Mfg. Co., Inc.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.

Carriers, Drum and Barrel

General Machine & W. W. Inc.
General Scientific Equipment Co.
Industrial Products Co.
Karel First Aid Supply Co.
Morse Mfg. Co., Inc.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Carriers, Food

Karel First Aid Supply Co.
Vacuum Can Co.

Carriers for Cylinders

Bomgardner Mfg. Co.
General Machine & W. W. Inc.
Karel First Aid Supply Co.
Rol-Away Truck Mfg. Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Chain

American Chain & Cable Co.
Columbus-McKinnon Chain Corp.
Taylor, S. G., Chain Co.

Chain, Coil

Canton Mfg. Co.
Taylor, S. G., Chain Co.

Chain, Spark Resisting

Ampco Metal, Inc.
Columbus McKinnon Chain Corp.
Taylor, S. G., Chain Co.

Chains, Magnet

Columbus McKinnon Chain Corp.
Multifinish Mfg. Co.
Taylor, S. G., Chain Co.

Chains, Sling

American Chain & Cable Co.
Columbus-McKinnon Chain Corp.
Taylor, S. G., Chain Co.
Wickwire-Spencer Div., Colorado Fuel & Iron Corp.

Chairs, Safety Boatswain

Brenton Equip. Co.
Bubrke, R. H., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Patent Scaffolding Co., Inc.

Chisel Grip

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
General Scientific Equipment Co.
Industrial Products Co.
McDonald, B. F., Co.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Standard Safety Equipment Co.
Tamco, Inc.

Chocks, Wheel

Bil-Jax, Inc.
Calumet Steel Castings Corp.
General Scientific Equipment Co.
New Jersey Safety Equip. Co.

Clamps

Brenton Equip. Co.
Brewer-Titchener Corporation, The
Charleston Rubber Co.
Custanite Corp.
Fisher Scientific Co.
Genter, C. D., Co.
Kensico Mfg. Co., Inc.
Merrill Bros.
New Jersey Safety Equip. Co.
Newman Mfg. & Sales Co.

Clamps, Rail

American Allsafe Co., Inc.
Bil-Jax, Inc.
Genter, C. D., Co.
Industrial Products Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Safety Equipment Co.

Clamps, Sockets and Eyebolts

Laughlin, Thomas, Div., American Hoist & Derrick Co.
Macwhyte Co.
Newman Mfg. & Sales Co.

Clamps, Wire Rope

Charleston Rubber Co.
Macwhyte Co.
Newman Mfg. & Sales Co.

Clay Gun

Bailey, W. M., Co.

Cleaners, Vacuum Industrial

Brulin & Co., Inc.
Clarke Sanding Machine Co.
Dameron Enterprises, Inc.
Doyle Vacuum Cleaner Co.
Finnell System, Inc.
Handling Devices Co., Inc.
Hild Floor Machine Co.
Hillyard Chemical Co.
Huntington Laboratories, Inc.
Ideal Industries, Inc.
Invincible Vacuum Cleaner Mfg. Co.
Kent Co., Inc.
Lincoln-Schlueter Floor Machy. Co.
Midland Laboratories
M-M-A, Inc.
National Disinfectant Co.

Cleaning Compounds or Solvents

Associated Just Distributors, Inc.
Brulin & Co., Inc.
Curran Corp.
Dameron Enterprises Inc.
Diversey Corp.
Dolge, C. B., Co.
DuPont, E. I., de Nemours & Co., Inc.
Fine Organics, Inc.
Finnell System, Inc.
Flor-Dry Co.
Franklin Research, Inc.
Fuld Bros., Inc.
Hallemite Mfg. Co.
Hild Floor Machine Co., Inc.
Hillyard Chemical Co.
Hollingshead Corp.
Homestead Valve Mfg. Co.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Kellite Corp.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
Midland Laboratories
Moore, John B., Corp.
National Disinfectant Co.
Packwood, G. H., Mfg. Co.
Penetone Co.
Pittsburgh Plate Glass Co.
Practical Mfg. Co.
Tect, Inc.
Turco Products, Inc.
Vestal, Inc.
West Disinfecting Co.
Wilkins Co., Inc.
Wyandotte Chemicals Corp.

Cleaning Machines, Floor

Brulin & Co., Inc.
Clarke Sanding Machine Co.
Dameron Enterprises, Inc.
Finnell System, Inc.
Handling Devices Co., Inc.
Hild Floor Maine Co.
Hillyard Chemical Co.
Homestead Valve Mfg. Co.
Huntington Laboratories, Inc.
Kent Co., Inc.
Lincoln-Schlueter Floor Machy. Co.
Midland Laboratories
National Disinfectant Co.
Tennant, G. H., Co.
Vestal, Inc.
West Disinfecting Co.

Cleaning Tissues, Goggle

American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Carhoff Co.
Dow Corning Corp.
Fisher Scientific Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kimberly-Clark Corp.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Co.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Silicone Paper Co. of America
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wilkins Co., Inc.

Climbers for Linemen

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Central Safety Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Klein, Mathias, & Sons
McDonald, B. F., Co.
Miller Equipment Co.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Climbers, for Swing Stage or Basket

Albina Engine & Machine Wks., Inc.
Bil-Jax, Inc.

Cloth, Coated, Safety

Raybestos-Manhattan, Inc.

Clothing, Acid Resistant

Advance Glove Mfg. Co.
Allied Glove Co.
American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Chem-Wear, Inc.
Davids Gloves, Inc.
Dunn Products
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Record Industrial Company
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Tower, A. J., Co.
West Disinfecting Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Clothing, Fireproofed

Advance Glove Mfg. Co.
Aljay Mfg. Co., Inc.
Allied Glove Co.
American Allsafe Co., Inc.
American-LaFrance Corp.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davids Gloves, Inc.
DuPont, E. I., de Nemours & Co.
Dunn Products
Far-Ex Corp.
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Company
Safety Clothing and Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Clothing, Industrial

Advance Glove Mfg. Co.
Aljay Mfg. Co., Inc.
Allied Glove Co.
American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Dunn Products
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Company
Safety Clothing and Equipment Co.
Safety First Supply Co.

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Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Tower, A. J., Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Clothing, Linemen's

Advance Glove Mfg. Co.
Aljay Mfg. Co., Inc.
American Allsafe Co., Inc.
American Optical Co.
Bashlin, W. M., Co.
Brenton Equip. Co.
Charleston Rubber Co.
Dorsey, John E., Co.
Dunn Products
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.
Sawyer Safety Products Co.
Scientific Industrial Supply Co.
Tower, A. J., Co.
Wheeler Protective Apparel, Inc.

Clothing, Protective

Advance Glove Mfg. Co.
Aljay Mfg. Co.
American Allsafe Co., Inc.
American-LaFrance Corp.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Dorsey, John E., Co.
Dunn Products
Ellwood Safety Appliance Co.
Far-Ex Corp.
Fibre-Metal Products Co.
Fisher Scientific Co.
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
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Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Safe-Way Industries, Inc.
Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Singer Glove Mfg. Co.
Standard Safety Equipment Co.
Tower, A. J., Co.
West Disinfecting Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Clothing, Rubber

Advance Glove Mfg. Co.
Allied Glove Co.
American Allsafe Co., Inc.
American LaFrance Corp.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Dorsey, John E., Co.
Dunn Products
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Genter, C. D., Co.
Goodrich, B. F., Co.
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Industrial Products Co.
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Safety First Supply Co.
Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Tower, A. J., Co.
U. S. Rubber Co.

Clothing Weatherproof

Allied Glove Co.
American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Dorsey, John E., Co.
Dunn Products
General Scientific Equipment Co.
General Textile Mills, Inc.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
New Jersey Safety Equip. Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Plastimayd Products Corp.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing and Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Scientific Industrial Supply Co., Inc.
Standard Glove Co.
Tower, A. J., Co.

Clothing for Women Workers

Advance Glove Mfg. Co.
Allied Glove Co.
Brenton Equip. Co.
Dunn Products
Genter, C. D., Co.
Industrial Gloves Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Record Industrial Company
Safety Clothing and Equipment
Safety First Supply Co.
Sawyer Safety Products Co.
Sawyer-Tower, Inc.
Tower, A. J., Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Collectors, Dust

Aerotec Corp.
Craftools, Inc.
Day Co.
Hild Floor Machine Co.
Johnson-March Corp.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Ruemelin Mfg. Co.
Schneible, Claude B., Co.
Surty Mfg. Co.
Torit Mfg. Co.
Wheelabrator Corp.

Collectors, Fume

Johnson-March Corp.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Ruemelin Mfg. Co.
Safety First Supply Co.
Schneible, Claude B., Co.
Wheelabrator Corp.

Conductometer

Conductive Hospital Accessories Co.
Federal Flooring Corp.

Connecting Links

Laughlin, Thomas, Div.,
American Hoist & Derrick Co.
Taylor, S. G., Chain Co.

Connectors, Electrical

Ericson Mfg. Co.
Ideal Industries, Inc.
Joy Mfg. Co.
Pyle-National Co.
Standard Electric Time Co.
United Cable Corp.

Connectors, Wire Rope

Macwhyte Co.

Containers, Explosive Liquid

Eagle Mfg. Co.
Industrial Products Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Polis, J. D., Mfg. Co.
Protectoseal Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Conveyors

Cleveland Tramrail Div.
Cleveland Crane & Engineering Co.
DeWalt, Inc.
General Machine & Welding Works, Inc.
Link-Belt Co.
Standard Conveyor Co.

Cords, Electric

Diamond Wire & Cable Co.
Ericson Mfg. Co.
Industrial Products Co.

Cords, Extension

Diamond Wire and Cable Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McGill Mfg. Co.
United Cable Corp.

Cots

Advance Glove Mfg. Co.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brossard, Lester L., Co.
Frank Mfg. Co., Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. K., Co., Inc.
Karel First Aid Supply Co.
New Jersey Safety Equipment Co.
Scientific Industrial Supply Co.
Searjeant Metal Products, Inc.
Washington Products Co.

Cots, Ambulance

Washington Products Co.

Cots, Finger

Industrial Gloves Co.

Cover Lens

American Industrial Safety Equipment Co.
American Optical Co.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Dockson Corp.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Jackson Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pioneer Scientific Corp.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sellstrom Manufacturing Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Willson Products, Inc.

Cover Lifter

McDonald, B. F., Co.

Covers, Self-Closing

Bustin Steel Products, Inc.
Protectoseal Co.

Crane, Electronic Safety Warning Devices

Electro-Alarm Safety Devices

Cranes

Cleveland Tramrail Div.
Cleveland Crane & Engineering Co.

Curtains, Fireproofed

Allied Glove Co.
Advance Glove Mfg. Co.
American Allsafe Co., Inc.
Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Central Safety Equipment Co.
Cotton Goods Mfg. Co.
Eastern Safety Equipment Co.
Far-Ex Corp.
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Safety Clothing and Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Trans Wall Coated Products—
Bemis Bro. Bag Co.
Wheeler Protective Apparel, Inc.

Curtains, Welder's

Advance Glove Mfg. Co.
Allied Glove Co.
American Allsafe Co., Inc.
Associated Bag & Apron Co.
Bemis Bro. Bag Co.—Trans Wall Coated Products
Boyer-Campbell Co.

See directory of Safety Equipment Sources for addresses.

Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Eastern Safety Equipment Co.
Frommelt Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
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Safety Clothing & Equipment Co.
Sawyer Safety Products Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Trans Wall Coated Products—
Bemis Bro. Bag Co.
Wheeler Protective Apparel, Inc.

Cutting Machines—Pipe

Wachs, E. H., Co.

D

Deck Platforms

Albina Engine & Machine Works, Inc.
American Abrasive Metals Co.
Bil-Jax, Inc.
Bustin Steel Products, Inc.
Magline Inc.

Degreasers—Parts

Associated Just Distributors, Inc.
Brulin & Co., Inc.
Hollingshead, R. M., Corp.
Huntington Laboratories, Inc.
Kellite Corp.
Magnus Chemical Co., Inc.
Moore, John B., Corp.
Packwood, G. H., Mfg. Co.
Practical Mfg. Co.
Protectoseal Co.
Tect, Inc.

Deodorizing Appliances

Associated Just Distributors, Inc.
Dameron Enterprises Inc.
Fuld Bros., Inc.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Midland Laboratories
Oxy-Catalyst, Inc.
West Disinfecting Co.

Detectors, Carbon Monoxide

Boyer-Campbell Co., The
Bacharach Industrial Inst. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
Fisher Scientific Company
General Scientific Equipment Co.
Kruger, Harold, Instruments
McDonald, B. F., Co.
Medical Supply Company
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Taller & Cooper, Inc.
U. S. Safety Service Co.

Detectors, Fire

American-LaFrance Corp.
"Automatic" Sprinkler Corp. of America
Davis Emergency Equipment Co.
Falcon Alarm Co., Inc.
Feenwal Incorporated
Ganewell Co.
Grinnell Co., Inc.
Kidde, Walter, & Co., Inc.
Mine Safety Appliances Co.
Notifier Corp.
Pyrene-C-O-Two Division
The Fyr-Fyter Co.
Taller & Cooper, Inc.

Detectors, Gas

Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Curtiss-Wright Corp.
General Scientific Equipment Co.
Johnson-Williams, Inc.
Kruger, Harold Instruments
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Taller & Cooper, Inc.

Detectors, Radiation

Curtiss-Wright Corp.

Detectors, Smoke

Cardox Corp.
Davis Emergency Equipment Co.
General Scientific Equipment Co.
Johnson-Williams, Inc.
Kidde, Walter, & Co., Inc.
Kruger, Harold, Instruments
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pyrene-C-O-Two Division
The Fyr-Fyter Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Taller & Cooper, Inc.

Directory of Codes, Standards and References

Loss Control Associates

Disinfectants and Deodorants

Associated Just Distributors, Inc.
Brulin & Co., Inc.
Dameron Enterprises, Inc.
Diversey Corp., The
Dolge, C. B., Co.
Fine Organics, Inc.
Fuld Bros., Inc.
Halperin, A. E., Co., Inc.
Hillyard Chemical Co.
Hollingshead, R. M., Corp.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Magnus Chemical Co., Inc.
McDonald, B. F., Co.
Midland Laboratories
Onox, Inc.
Scientific Industrial Supply Co.
Vestal, Inc.
West Disinfecting Co.

Dispensary Equipment

Aloe, A. S., Co.
Brenton Equip. Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Midland Laboratories
Oil-Dri Corp. of America
Safety Clothing and Equipment Co.
Safety First Supply Co.
Smith, D. B., & Co., Inc.

Dispensers, Foot Spray

Karel First Aid Supply Co.
Safety Clothing & Equipment Co.
Sani-Mist, Inc.

Dispensers, Goggle Cleaning

American Allsafe Co., Inc.
American Optical Co.
Brenton Equip. Co.
Buckley Corp.
Bullard, E. D., Co.
Dow Corning Corp.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing and Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Silicone Paper Co. of America
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wilkins Co., Inc.

Dispensers, Protective Ointments

Hygiene Research Inc.

Dispensers, Salt Tablet

Ace Mfg. Co.
American Allsafe Co., Inc.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
International Salt Co., Inc.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Morton Salt Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Silicone Paper Co. of America, Inc.
Standard Safety Equipment Co.
U. S. Safety Service Co.

Dispensers, Sanitary Napkins

Dameron Enterprises, Inc.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
National Disinfectant Co.
Searjeant Metal Products, Inc.
West Disinfecting Co.

Dispensers, Soap

Bradley Washfountain Co.
Brenton Equip. Co.
Brulin & Co., Inc.
Chemical Corp.
Dameron Enterprises, Inc.
Dolge, C. B., Co.
Finnell Systems, Inc.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Hillyard Chemical Co.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Lightfoot Schultz Co.
Midland Laboratories
New Jersey Safety Equip. Co.
Packwood, G. H., Mfg. Co.
Safety Clothing and Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Turco Products, Inc.
Vestal, Inc.
West Disinfecting Co.

Dockboards

Dazzo Products, Inc.
Frommelt Industries
Industrial Products Co.
Searjeant Metal Products, Inc.

Dock Shelter

Bustin Steel Products, Inc.
Frommelt Industries
Industrial Products Co.
Magline, Inc.
Peneo Engineering Co.
Searjeant Metal Products, Inc.

Doors, Fire and Service

Kinnear Mfg. Co.
Trans Wall Coated Products,
Bemis Bro. Bag Co.

Doors, Panic Device

American Allsafe Co., Inc.
Vonnegut Hardware Co.

Drill Table, Safety

Franklin, Bernard, Co., Inc.
Modern Machine Tool Co.

Drinking Cups, Paper

Bullard, E. D., Co.
Continental Can Co.
Dameron Enterprises, Inc.
Davis Emergency Equipment Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
Medical Supply Co.
Safety Clothing and Equipment Co.
U. S. Envelope Co.

Drinking Fountain Mats

Brabrook, A. N., Inc.

Drinking Fountains

Bradley Washfountain Co.
Halperin, A. E., Co., Inc.
Haws Drinking Faucet Co.
McDonald, B. F., Co.
Safety First Supply Co.
Smith, D. B., & Co., Inc.
Taylor, Halsey W., Co.
Temprite Products Corp.

Drinking Fountains, Portable

Brenton Equip. Co.
Haws Drinking Faucet Co.
Industrial Products Co.
McDonald, B. F., Co.
New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Smith, D. B., & Co., Inc.

Driver Training Materials

National Safety Council
Porto-Clinic Instruments Co.

Drum Fittings

Goodyear Industrial Products Co., Inc.
Merrill Bros.
Miller Products Co., Inc.
New Jersey Safety Equip. Co.
Protectoseal Co., The

Drum Movers

Bustin Steel Products, Inc.
General Machine & Welding Works, Inc.
Industrial Products Co.
Morse Mfg. Co., Inc.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.

Drum Openers

Industrial Products Co.
Merrill Bros.
Morse Mfg. Co., Inc.
Safety Clothing & Equipment Co.

Drum Valve

Central Safety Equipment Co.
Morse Mfg. Co., Inc.
Protectoseal Co., The

Drums

Cesco

Dryers, Electric, Safety Equipment

Chicago Hardware Foundry Co.

Dryers, Face and Hand Electric

Chicago Hardware Foundry Co.
Electric-Aire Engineering Corp.
General Scientific Equipment Co.
Huntington Laboratories, Inc.

To locate Advertisements, see Advertisers' Index.

Ducts
Cesco

Dust Arresters
Associated Just Distributors, Inc.
Fuhl Bros. Inc.
Johnson-March Corp.
Ruemelin Mfg. Co.
Schneible, Claude B., Co.
Wheelabrator Corp.

Dust Collectors
Aerotec Corp.
Craftools, Inc.
Day Co.
Johnson-March Corp.
Mine Safety Appliances Co.
Ruemelin Mfg. Co.
Schneible, Claude B., Co.
Torit Mfg. Co.
Westinghouse Electric Corp., Sturtevant Div.—Hyde Park
Wheelabrator Corp.

Dust Control Systems
Johnson-March Corp.
Legge, Walter G., Co., Inc.
Taller & Cooper, Inc.
Trane Co.
Wheelabrator Corp.

Dust Counter
Bausch & Lomb Optical Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Willson Products, Inc.

Dust Hoods
Acme Protection Equipment Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Craftools, Inc.
DeWalt, Inc.
Dockson Corp.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Sawyer Safety Products Co.
Schneible, Claude B., Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Wagco Products, Inc.
Willson Products, Inc.

Dust Suction Equipment
Craftools, Inc.
Flexaust Co.
New York Belting & Packing Co.
Ruemelin Mfg. Co.
Torit Mfg. Co.

Dusters, Rock
Mine Safety Appliances Co.

Dyna-Switch
Dillon, W. C., & Co.

Dynamometers, Tension Gage
Walpole Co., The

E

Ear Stopples
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co.
Flents Products Co., Inc.
General Scientific Equipment Co.
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Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Maico Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety Ear Protector Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sigma Eng. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Surgical Mechanical Research Inc.
United Cable Co.

Ejectors, Air
Littell, F. J., Machine Co.
Pyle-National Co.
Safety Clothing and Equipment Co.
Schrader's, A., Son Division of Scovill Mfg. Co., Inc.
Standard Safety Equipment Co.

Electric Two Hand Clutch Controls for Power Machines
Micro Switch, a Division of Honeywell

Electrode Holders
Aljay Mfg. Co., Inc.
American Industrial Safety Equipment Co.
Boyer-Campbell Co.
Buhrke, R. H., Co.
Fibre-Metal Products Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Jackson Products
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.

Electronic Indicating Ground,
Gilbert & Barker Mfg. Co.

Elevating Table
Bomgardner Mfg. Co.
Economy Engineering Co.
Hamilton Tool Co.
Karel First Aid Supply Co.

Emblems, Safety
Award Incentives
Brady, W. H., Co.
Genter, C. D., Co.
House of Williams
Matthews, Jas. H., & Co.
Metal Arts Co., Inc.
National Safety Council
New Jersey Safety Equip. Co.
Ready Made Sign Co., Inc.
Williams Jewelry & Mfg. Co.

Emergency Lighting
American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co.
Carpenter Mfg. Co.
Dual-Lite Co.
Dynaseal Corp.
Eastern Metal of Elmira, Inc.
Electric Cord Co.
Exide Industrial Div., Electric Storage Battery Co.
General Scientific Equipment Co.
Justrite Manufacturing Company
Karel Firt Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Nickel Cadmium Battery Corp.
Pyle-National Co.
Prairie State Products Co.
Safety Clothing & Equipment Co.
Seco Safety Products Co
Standard Electric Time Co.
U-C Lite Mfg. Co.

Exhaust Purifier, Catalytic
Oxy-Catalyst, Inc.

Explosion-Proof Switches
Micro Switch Div. of Minneapolis-Honeywell Regulator Co.
Pyle-National Co.

Explosives Carrier
Mine Safety Appliances Co.

Exterminator, Rodent
Dolge, C. B., Co.
West Disinfecting Co.

Eyeglass Case
Opticase Co., The

Eye Shades, Non-Flammable
Boyer-Campbell Co., The
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Dockson Corp.
Dunn Products
Fendall Co.
Genter, C. D., Co.
Jones & Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Sellstrom Mfg. Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Eye Shields
American Industrial Safety Equipment Co.
American Optical Co.
Armorlite Lens Co., Inc.
Bausch & Lomb Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Dockson Corp.
Dunn Products
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Jackson Products Co.
Kimball Safety Products
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Willson Products, Inc.

Eye Washing Fountain
American Allsafe Co., Inc.
Benson & Associates
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Haws Drinking Faucet Co.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sellstrom Mfg. Co.
Speakman Co.
Standard Safety Equipment Co.

Eyesight Surveys
American Optical Co.
Bausch & Lomb Optical Co.
Keystone View Co.
U. S. Safety Service Co.

F

Face Shields
American Allsafe Co., Inc.
American Industrial Safety Equipment Co.
American Optical Co.
Bausch & Lomb Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
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Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co.
Dockson Corp.
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Jackson Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing and Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Wheeler Protective Apparel, Inc.
Willson Products, Inc.

Fans, Exhaust
Allied Witan Co.
Carey, Philip, Mfg. Co.
Coppus Engineering Co.
DeVilbiss Co.
General Blower Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Robbins & Myers, Inc.
Trane Co.
Westinghouse Electric Corp., Sturtevant Div. – Hyde Park

Fan Guards
Boyer-Campbell Co., The
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
New Jersey Safety Equip. Co.
Rochester Safety Equipment Co.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.

See directory of Safety Equipment Sources for addresses.

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Fans, Ventilating

Carey, Philip, Mfg. Co.
Coppus Engineering Corp.
General Blower Co.
Mine Safety Appliances Co.
Robbins & Myers, Inc.
Trane Co.
Westinghouse Electric Corp., Sturtevant Div. – Hyde Park

Faucets, Self-Closing

Central Safety Equipment Co.
Haws Drinking Faucet Co.
New Jersey Safety Equip. Co.
Protectoseal Co., The
Speakman Co.

Feeders, Punch Press

Boyer-Campbell Co.
Industrial Products Co.
Littell, F. J., Machine Co.
New Jersey Safety Equip. Co.
Osborn Mfg. Co.
Searjeant Metal Products, Inc.

Feeders, Punch Press, Magnetic

Multifinish Mfg. Co

Fillers, Gasoline

Brenton Equip. Co.
Eagle Mfg. Co.
McDonald, B. F., Co.

Film Badge Service

Landauer, R. S. Jr., & Co.
R-C Scientific Instrument Co.

Films or Slides, Safety

American Optical Co.
Association Films, Inc.
Audio Production, Inc.
Eastman Kodak Co.
Falcon Alarm Co., Inc.
Ideal Pictures
Modern Talking Picture Service, Inc.
National Safety Council – Part 2
Protectoseal Co., The
United World Films, Inc.

Filters, Air Device

Allied Witan Co.
Coppus Engineering Corp.
DeVilbiss Co.
Engman Engineering Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Safety First Supply Co.
Schrader's, A., Son Div. of Scovill Mfg. Co., Inc.
Westinghouse Electric Corp., Sturtevant Div. – Hyde Park

Fire Alarms

Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Gamewell Co.
Grinnell Co., Inc.
Kidde, Walter & Co., Inc.
Lord-Taber Co., Inc.
Notifier Corp.
Pyrene C-O-Two Div. The Fyr-Fyter Co.
Safety First Supply Co.
Sperti Faraday, Inc.
Standard Electric Time Co.
Sterling Siren Fire Alarm Co., Inc.

Fire Detectors

American-LaFrance Corp.
"Automatic" Sprinkler Corp. of America
Cardox Corp.
Electronics Corp. of America
Falcon Alarm Co., Inc.
Fenwal Inc.
Gamewell Co.
Grinnell Co., Inc.
Kidde, Walter, & Co., Inc.
Lord-Taber Co., Inc.
Mine Safety Appliances Co.
Notifier Corp.
Pyrene C-O-Two Div. The Fyr-Fyter Co.

Fire Doors

Kinnear Mfg. Co.

Fire & Explosive Proof Permanent Magnetic Pulleys

Cesco

Fire Extinguishers

Ace Fire Equipment Co.
Allen, W. D., Mfg. Co.
American Industrial Safety Equipment Co.
American-LaFrance Corp.
Ansul Chemical Co.
"Automatic" Sprinkler Corp. of America
Brenton Equip. Co.
Buffalo Fire Appliance Corp.
Firetox System, Inc.
Fisher Scientific Co.
Fyr-Fyter Co., The
Genter, C. D., Co.
Justrite Mfg. Co.
Kidde, Walter, & Co., Inc.
M-M-A Inc.
McDonald, B. F., Co.
National Foam System, Inc.
Protectoseal Co., The
Pulmosan Safety Equipment Corp.
Pyrene-C-O-Two Division The Fyr-Fyter Co.
Randolph Laboratories, Inc.
Red Comet, Inc.
Safety Clothing & Equipment Co.
Safety First Products Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Smith, D. B., & Co., Inc.
Stop-Fire, Inc.

Fire Extinguisher Recharges and Equipment

Ace Fire Equipment Co.
Allen, W. D., Mfg. Co.
American-LaFrance Corp.
Ansul Chemical Co.
Brenton Equip. Co.
Genter, C. D., Co.
Kidde, Walter, & Co., Inc.
Nat'l Foam System, Inc.
Pulmosan Safety Equipment Corp.
Pyrene-C-O-Two Division The Fyr-Fyter Co.
Randolph Laboratories, Inc.
Red Comet, Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Stop-Fire, Inc.

Fire Extinguisher Seals

Ace Fire Equipment Co.
Genter, C. D., Co.
Red Comet, Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.

Fire Extinguishing Foam

Ace Fire Equipment Co.
Allen, W. D., Mfg. Co.
American-LaFrance Corp.
"Automatic" Sprinkler Corp. of America
Central Safety Equipment Co.
Genter, C. D., Co.
Grinnell Co., Inc.
National Foam System, Inc.
Pulmosan Safety Equipment Corp.
Pyrene-C-O-Two Division The Fyr-Fyter Co.
Rockwood Sprinkler Corp.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.

Fire Extinguishing Systems

Allen, W. D., Mfg. Co.
American-LaFrance Corp.
Ansul Chemical Co.
"Automatic" Sprinkler Corp. of America
Bean, John, Div. Food Machine & Chemical Corp.
Cardox Corp.
Central Safety Equip. Co.
Firetox System, Inc.
Genter, C. D., Co.
Grinnell Co., Inc.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pyrene-C-O-Two Division The Fyr-Fyter Co.
Randolph Laboratories, Inc.
Red Comet, Inc.
Seco Safety Products Co.

Fire Foam Generators

American-LaFrance Corp.
Central Safety Equipment Co.
Grinnell Co., Inc.
National Foam System, Inc.
Safety First Supply Co.
Seco Safety Products Co.

Fire Hose

Ace Fire Equipment Co.
Allen, W. D., Mfg. Co.
American Allsafe Co., Inc.
American-LaFrance Corp.
Bean, John, Division Food Machinery & Chemical Corp.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Miller Products Co., Inc.
New York Belting & Packing Co.
Pulmosan Safety Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.

Fire Hose, Mine

Mine Safety Appliances Co.

Fire Hose Reels

American-LaFrance Corp.
Central Safety Equipment Co.
Bean, John, Div. Food Machine & Chemical Corp.
Hannay, Clifford B., & Sons, Inc.

Fire Nozzles

Akron Brass Mfg. C.
Allen, W. D., Mfg. Co.
American Allsafe Co., Inc.
American-LaFrance Corp.
Ansul Chemical Co.
"Automatic" Sprinkler Corp. of America
Bean, John, Div. Food Machine & Chemical Corp.
Central Safety Equipment Co.
Genter, C. D., Co.
McIntyre, F. N., Brass Works, Inc.
Rockwood Sprinkler Corp.
Seco Safety Products Co.

Fire Pumps

American-LaFrance Corp.
Ansul Chemical Co.
Bean, John, Div. Food Machine & Chemical Corp.
Ingersoll-Rand Co.
Safety First Supply Co.
Smith, D. B., & Co., Inc.

Fire Resistant Hydraulic Fluids

Carbide & Carbon Chemicals Co.
Monsanto Chem. Co.
Shell Oil Co.

Fire Sirens

American-LaFrance Corp.
Bomgardner Mfg. Co.
Federal Sign & Signal Corp.
Gamewell Co.
Genter, C. D., Co.
Pyle National Co.
Seco Safety Products Co.
Sterling Siren Fire Alarm Co., Inc.

Fire Trac

C. M. C. Co.

Fire Trucks

American-LaFrance Corp.
Ansul Chemical Co.
Bean, John, Div. Food Machine & Chemical Corp.
C. M. C. Co.
Cardox Corp.
Seco Engineering & Mfg. Inc., Div. of Seco Safety Products Co.

First Aid Cabinets

Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
Fisher Scientific Co.
General Scientific Equip. Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.

First Aid Kits

Aloe, A. S., Co.
American-LaFrance Corp.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
D. R. S. Labs.
Frank Mfg. Co.
General Scientific Equip. Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pac-Kit Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.

First Aid Materials

Aloe, A. S., Co.
Bomgardner Mfg. Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Chesebrough Mfg. Co.
Davis Emergency Equip. Co., Inc.
Fisher Scientific Co.
General Bandage, Inc.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Kip, Inc.
McDonald, B. F., Co.
McDowell Mfg. Co.
Medical Supply Co.
Mine Safety Appliances Co.
Pac-Kit Co.
Pulmosan Safety Equipment Corp.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co
Universal Match Corp.

To locate Advertisements, see Advertisers' Index.

First Aid Room Equipment

Aloe, A. S., Co.
Bomgardner Mfg. Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Carhoff Co.
Davis Emergency Equipment Co., Inc.
E & J Mfg. Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Igalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc., Industrial Safety Supplies Div.
Seco Safety Products Co.

First Aid Trainer

Karel First Aid Supply Co.
Safety First Supply Co.

Flags, Danger

Brenton Equip. Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Eastern Metal of Elmira, Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Overton, R. B., Co. (Mfrs. Elkay Safety Signals)
Prairie State Products Co.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Stonehouse Signs, Inc.

Flags, Safety

Brenton Equip. Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Eastern Metal of Elmira, Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
National Safety Council - Part 2
New Jersey Safety Equipment Co.
Overton, R. B., Co.
Plastimayd Products Corp.
Prairie State Products Co.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Vari-Products Co.

Flame Retardant for Fabrics

Central Safety Equipment Co.
DuPont, E. I., de Nemours & Co., Inc.
Flamort Chemical Co.
Frommelt Industries
Huntington Laboratories, Inc.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Flashlight Batteries

Bullard, E. D., Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.

Flashlights

American Allsafe Co., Inc.
Browne, Stewart R., Mfg. Co., Inc.
Boyer-Campbell Co., The
Bullard, E. D., Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Hornik, Frederick
Industrial Products Co.
Justrite Mfg. Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.

Flashlights, Permissible

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Browne, Stewart R., Mfg. Co., Inc.
Davis Emergency Equip. Co., Inc.
General Scientific Equipment Co.
Industrial Products Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Floodlights, Emergency

American Allsafe Co., Inc.
American-LaFrance Corp.
American Optical Co. - Safety Div.
Boyer-Campbell Co., The
Browne, Stewart R., Mfg. Co., Inc.
Electric Cord Co.
Exide Industrial Div., Electric Storage Battery Co., The
General Scientific Equipment Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pyle-National Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
U-C Lite Mfg. Co.

Floor Absorbant

Eagle-Picher Co., The

Floor Cleaning Machines, Electric

American Floor Surfacing Machine Co.
Brulin & Co., Inc.
Clarke Sanding Machine Co.
Dameron Enterprises, Inc.
Finnell System, Inc.
Handling Devices Co., Inc.
Hild Floor Machine Co., Inc.
Hillyard Chemical Co.
Huntington Laboratories, Inc.
Kent Co., Inc.
Lincoln-Schlueter Floor Machy. Co.
Masury-Young Co.
National Disinfectant Co.
Scientific Industrial Supply Co., Inc.
Tennant, G. H., Co.
Vestal, Inc.
West Disinfecting Co.

Floor Coating, Conductive, Non-Slip

American Abrasive Metals Co.
Associated Just Distrs., Inc.
Brulin & Co., Inc.
Carey, Phillip, Mfg. Co., The
Conductive Hospital Access. Corp.
Custanlite Corp.
Dameron Enterprises, Inc.
Eagle-Picher Co.
Federal Flooring Corp.
Flintkote Co.
Fuld Bros., Inc.
Hallemite Mfg. Co.
Huntington Laboratories, Inc.
Kelley-Mahorney Co.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
Midland Laboratories
Oil-Dri Corp. of America
Vestal, Inc.

Floor Finishing Compounds

American Abrasive Metals Co.
Associated Just Distrs., Inc.
Brulin & Co., Inc.
Carey, Phillip, Mfg. Co., The
Dameron Enterprises, Inc.
Dolge, C. B., Co.
DuPont, E. I., de Nemours & Co., Inc.
Finnell System, Inc.
Franklin Research Co.
Fuld Bros., Inc.
Hild Flooring Machine Co.
Hillyard Chemical Co.
Hollingshead, R. M., Corp.
Huntington Laboratories, Inc.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
Master Builders Co.
Masury-Young Co.
Midland Laboratories
Miracle Adhesive Corp.
National Disinfectant Co.
Penetone Co., The
Pittsburgh Plate Glass Co.
Tennant, G. H., Co.
Turco Products, Inc.
Vestal, Inc.
West Disinfecting Co.

Floor Plate, Abrasive

Alan Wood Steel Co.
American Abrasive Metals Co.

Floor Plate, Steel

Alan Wood Steel Co.
American Abrasive Metals Co.
American Allsafe Co., Inc.
Globe Co., Grip-Strut Div.
Inland Steel Co.
Jones & Laughlin Steel Corp.
Kemp Metal Grating Corp.
Reliance Steel Products Co.
United States Steel Corp.

Flooring Materials, Safety

Alan Wood Steel Co.
American Abrasive Metals Co.
Bustin Steel Products, Inc.
Dameron Enterprises, Inc.
Eagle-Picher Co.
Finnell System, Inc.
Flintkote Co.
Fulton Asphalt Co., Permamix Div.
Globe Co., Grip-Strut Div.
Hallemite Mfg. Co.
Kemp Metal Grating Corp.
Legge, Walter G., Co., Inc.
Master Builders Co.
Masury-Young Co.
McDonald, B. F., Co.
Meiflex Products Co.
Miller Products Co. Inc.
Minnesota Mining and Mfg. Co.
Miracle Adhesives Corp.
Mitchell Rubber Products, Inc.
Permamix Corp.
Superior Rubber Mfg. Co.

Flowline Traps

Cesco

Fluorescent Tube Disposal

Laduby Co., Inc.
New Jersey Safety Equipment Co.
Standard Safety Equipment Co.

Fog Guns

Bean, John, Div. Food Machine & Chemical Corp.
Cardox Corp.
Central Safety Equipment Co.
Genter, C. D., Co.
Seco Safety Products Co.

Fog-Nozzle

Akron Brass Mfg. Co.
Allen, W. D., Mfg. Co.
"Automatic" Sprinkler Corp. of America
Bean, John, Div. Food Machine & Chemical Corp.
Blaw-Knox Co.
Cardox Corp.
Central Safety Equipment Co.
Genter, C. D., Co.
Safety First Supply Co.
Seco Safety Products Co.

Fog Pumps

Bean, John, Div. Food Machine & Chemical Corp.
Seco Safety Products Co.

Food Carriers

Central Safety Equipment Co.
General Scientific Equipment Co.
Karel First Aid Supply Co.
Vacuum Can Co.

Foot Guards

Aljay Mfg. Co., Inc.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Dunn Products
Elwood Safety Appliance Co.
Industrial Gloves Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Wheeler Protective Apparel, Inc.

Foot Mats, Disinfecting

Huntington Laboratories, Inc.
McDonald, B. F., Co.
Sani-Mist, Inc.
Searjeant Metal Products, Inc.

Foot Mats, Skin-Toughening

Huntington Laboratories, Inc.
McDonald, B. F., Co.
Onox, Inc.

Fuller's Earth

Dameron Enterprises, Inc.
Dri-Rite Co.
Halperin, A. E., Co., Inc.
Oil-Dri Corp. of America
Scientific Industrial Supply Co., Inc.
Tamms Industries, Inc.

Fume Collectors

Acme Protection Equipment Co.
Fisher Scientific Co.
Johnson-March Corp.
Mine Safety Appliances Co.
Oxy-Catalyst, Inc.
Ruemelin Mfg. Co.
Safety First Supply Co.
Schneible, Claude B., Co.
Wheelabrator Corp.

Fumigants

Associated Just Distrs., Inc.
Dolge, C. B., Co.
Dow Chemical Co.
DuPont, E. I., de Nemours & Co., Inc.
Fuld Bros., Inc.
Huntington Laboratories, Inc.
Midland Laboratories
West Disinfecting Co.

Fungicides

Associated Just Distrs., Inc.
Dolge, C. B., Co.
Dow Chemical Co.
DuPont, E. I., de Nemours & Co., Inc.
Fuld Bros., Inc.
Huntington Laboratories, Inc.
National Disinfectant Co.
Onox, Inc.
Pittsburgh Plate Glass Co.
Vestal, Inc.
West Disinfecting Co.

Fuse Pullers

Boyer-Campbell Co., The
Brenton Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.

See directory of Safety Equipment Sources for addresses.

G

Gage Glasses

American Industrial Safety Equip. Co.
Dickson Corp.
Glendale Optical Co., Inc.
Safety Clothing & Equipment Co.
Sellstrom Mfg. Co.

Gastester

Davis Emergency Equipment Co., Inc.
Johnson-Williams, Inc.
Kruger, Harold, Instruments

Germicides

American Optical Co., - Safety Div.
Associated Just Distrs., Inc.
Dameron Enterprises, Inc.
Diversey Corp.
Dolge, C. B., Co.
Dow Chemical Co.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Midland Laboratories
Pulmosan Safety Equipment Corp.
Vestal, Inc.
West Disinfecting Co.
Willson Products, Inc.

Glass, Safety

American Optical Co. - Safety Div.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Dickson Corp.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Libby-Owens-Ford Glass Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Pittsburgh Plate Glass Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.
Sellstrom Mfg. Co.
Standard Glove Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.

Glass, Welding Plates and Lenses

American Optical Co.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Davis Emergency Equip. Co., Inc.
Dickson Corp.
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Jackson Products, Inc.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Willson Products, Inc.

Gloves, Aluminized

Olympic Glove Co., Inc., The

Gloves, Heat-Resistant

Olympic Glove Co., Inc., The

Gloves, Linemen's Protector

Aljay Mfg. Co., Inc.
Advance Glove Mfg. Co.
American Allsafe Co., Inc.
Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Davis Emergency Equip. Co., Inc.
Dunn Products
Eastern Safety Equipment Co.
Gebhardt, A. L., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Mine Safety Appliances Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Wheeler Protective Apparel, Inc.
Wickman Glove Co.
Wilson Rubber Co.
Wolverine Shoe & Tanning Corp.

Gloves and Mittens

Advance Glove Mfg. Co.
Aljay Mfg. Co.
American Allsafe Co., Inc.
American Industrial Safety Equip. Co.
American Optical Co.
American Rubberizing Co.
Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Dickson Corp.
Dunn Products
Eastern Safety Equipment Co.
Edmont Mfg. Co.
Eisendrath Glove Co.
Fibre-Metal Products Co.
Fisher Scientific Co.
Gebhardt, A. L., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Goodyear Industrial Products Co., Inc.
Granet Corp.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Jomac, Inc.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
Kunz Glove Co.
McDonald, B. F., Co.
Miller Equipment Co.
Miller Products Co. Inc.
Mine Safety Appliances Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sieberling Latex Prods. Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Surety Rubber Co.
Wearhide Glove Co.
Wheeler Protective Apparel, Inc.
Wickman Glove Co.
Wilson Rubber Co.
Wolverine Shoe & Tanning Corp.

Gloves, Neoprene

Olympic Glove Co., Inc., The

Gloves, Reclaiming

Advance Glove Mfg. Co.
American Optical Co., Safety Div.
Scientific Industrial Supply Co.
Wash-Rite Co., Inc.

Gloves, Rubber or Synthetic

Advance Glove Mfg. Co.
American Allsafe Co., Inc.
American Optical Co.
American Rubberizing Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davids Gloves, Inc.
Dunn Products
Eastern Safety Equipment Co.
Edmont Mfg. Co.
Fisher Scientific Co.
Gebhardt, A. L., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Granet Corp.
Hood Rubber Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Miller Products Co. Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Pioneer Rubber Co.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Surety Rubber Co.
Wilson Rubber Co.
Wolverine Shoe & Tanning Corp.

Gloves, Work

Olympic Glove Co., Inc., The

Goggle Cleaner

American Allsafe Co., Inc.
American Optical Co.
Associated Just Distrs., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Buckley Corp.
Carhoff Co.
Chicago Eye Shield Co.
Dow Corning Corp.
Fendall Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Kimberly-Clark Corp.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Silicone Paper Co. of America, Inc., The
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wilkins Co., Inc.

Goggle Cleaning Dispensers

American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Buckley Corp.
Carhoff Co.
Dow Corning Corp.
Fendall Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Silicone Paper Co. of America, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wilkins Co., Inc.

Goggle Valves

American Optical Co. - Safety Div.
Bailey, W. M., Co.

Goggles

American Industrial Safety Equip. Co.
American Optical Co.
Bausch & Lomb Optical Co.
Brossard, Lester L., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Cover, H. S., Co.
Davids Gloves, Inc.
Dickson Corp.
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
Fisher Scientific Co.
General Scientific Equip. Co.
Glendale Optical Co., Inc.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Jackson Products
Jones & Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pioneer Scientific Corp.
Plaseo Safety Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.

To locate Advertisements, see Advertisers' Index.

Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Willson Products, Inc.

Gongs, Sirens, Horns and other Signaling Devices

American-LaFrance Corp.
"Automatic" Sprinkler Corp. of America
Bullard, E. D.
Falcon Alarm Co., Inc.
Gamewell Co., The
Genter, C. D., Co.
McDonald, B. F., Co.
Safety First Supply Co.
Seco Safety Products Co.

Graphic Presentations

Chart-Pak, Inc.

Gratings, Safety

American Abrasive Metals Co.
Blaw-Knox Co.
Boyer-Campbell Co., The
Bustin Steel Products, Inc.
Globe Co.
Kiemp Metal Grating Corp.
Reliance Steel Products Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
U S. Steel Co.
Wood, Alan, Steel Co.

Grinders, Tool

DeWalt, Inc.
Scheer Co., Inc.

Grounding Device, Electronic

Gilbert & Barker Mfg. Co.
Legge, Walter G., Co., Inc.

Guard Materials

Brossard, Lester L., Co.
Falcon Alarm Co., Inc.
Globe Co., Grip-Strut Div.
Harrington & King Perforating Co., Inc., The
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Guards, All-Steel, Corner

Randolph Indust. Equip. Co.

Guards, Chip and Spark

Frommelt Industries
Industrial Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products Co., Inc.
Standard Safety Equipment Co.

Guards for Edged Tools

Bashlin, W. M., Co.
Brenton Equip. Co.
Buhrke, R. H., Co.
DeWalt, Inc.
Safety First Supply Co.

Guards, Fan

Boyer-Campbell Co., The
General Scientific Equip. Co.
Rochester Safety Equipment Co.
Safety Clothing & Equipment Co.

Guards, Foot and Toe

Advance Glove Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equip. Co.
Ellwood Safety Appliance Co.
General Scientific Equip. Co.
Industrial Gloves Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products Co., Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Guards, Gear

Pulmosan Safety Equipment Corp.
Safety First Supply Co.
Searjeant Metal Products Co., Inc.
Surty Mfg. Co.

Guards, Glass Gage

Boyer-Campbell Co., The
McDonald, B. F., Co.
Safety Clothing & Equipment Co.

Guards, Grinders Portable

American Allsafe Co., Inc.
Boyer-Campbell Co.
Brossard, Lester L., Co.
Central Safety Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Morrison Products, Inc.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products Co., Inc.

Guards, Grinding Wheel

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D.
Central Safety Equipment Co.
Chicago Eye Shield Co.
DeWalt, Inc.
General Scientific Equipment Co.
Industrial Products Co.
Junkin Safety Appliances Co., Inc.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products Co., Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Surty Mfg. Co.

Guards, Guide Pin

Boyer-Campbell Co.
Central Safety Equipment Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Wiesman Mfg. Co.

Guards, Jointer

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Central Safety Equipment Co.
DeWalt, Inc.
General Scientific Equipment Co.
Industrial Products Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Surty Mfg. Co.

Guards, Kick Press

Boyer-Campbell Co., The
Central Safety Equipment Co.
General Scientific Equipment Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products Co., Inc.
Surty Mfg. Co.

Guards, Lathe

Brenton Equip. Co.
Central Safety Equipment Co.
General Scientific Equipment Co.
Globe Co., Grip-Strut Div.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products Co., Inc.
Surty Mfg. Co.

Guards, Milling Machine

Bullard, E. D., Co.
Central Safety Equipment Co.
General Scientific Equipment Co.
Globe Co., Grip-Strut Div.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Searjeant Metal Products Co., Inc.

Guards, Planer

Brenton Equip. Co.
Central Safety Equipment Co.
DeWalt, Inc.
General Scientific Equipment Co.
Globe Co., Grip-Strut Div.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products Co., Inc.
Surty Mfg. Co.

Guards, Platen Press

Bullard, E. D., Co.
Central Safety Equipment Co.
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Safety Clothing & Equipment Co.
Surty Mfg. Co.

Guards, Portable Lamp

Browne, Stewart R., Mfg. Co., Inc.
Electric Cord Co.
Ericson Mfg. Co., The
General Scientific Equipment Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
New Jersey Safety Equip. Co.
Surty Mfg. Co.
U-C Lite Mfg. Co.

Guards, Power Press

American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Electronic Control Corp.
General Scientific Equipment Co.
Globe Co., Grip-Strut Div.
Junkin Safety Appliances Corp.
Kenco Mfg. Co.
Littell, F. J., Machine Co.
Magline Inc.
Micro Switch - Div. of Minneapolis Honeywell Regulator Co.
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Positive Safety Mfg. Co.
Pulmosan Safety Equipment Corp.
Safeguard Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Schrader's, A., Son Div. of Scovill Mfg. Co., Inc.
Searjeant Metal Products Co., Inc.
Seco Safety Products Co.
Surty Mfg. Co.
Wiesman Mfg. Co.

Guards, Power Shear

Bullard, E. D., Co.
Electronic Control Corp.
General Scientific Equipment Co.
Globe Co., Grip-Strut Div.
Micro Switch - Div. of Minneapolis Honeywell Regulator Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Schrader's, A., Son Div. of Scovill Mfg. Co., Inc.
Searjeant Metal Products, Inc.
Surty Mfg. Co.

Guards, Saw

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Bashlin, W. M., Co.
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Brett-Guard Co.
Buhrke, R. H., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
DeWalt, Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
New Jersey Safety Equipment Co.
Newton Engineering Service
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Singer Glove Mfg. Co.
Standard Safety Equipment Co.
Surty Mfg. Co.

Guards, Shaper

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Central Safety Equipment Co.
DeWalt, Inc.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Surty Mfg. Co.

Guards, Shin

Advance Glove Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Ellwood Safety Appliance Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Wheeler Protective Apparel, Inc.

Guards, Wire

Ericson Mfg. Co., The
Gets-a-Lite Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Gutters, Door Rain

Dazzo Products, Inc.

H

Hair Guards

Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Chic-Maid Hat Mfg. Co., Inc.
General Scientific Equipment Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

See directory of Safety Equipment Sources for addresses.

Hand Cream, Protective

Advance Glove Mfg. Co.
American Ailsafe Co., Inc.
American Optical Co.—Safety Div.
Ayerst Laboratories
Boyer-Campbell Co.
Brenton Equip. Co.
Breck, John H., Inc.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Cadet Laboratories
Central Safety Equipment Co.
Chemical Corp.
Dameron Enterprises, Inc.
Davis Emergency Equip. Co., Inc.
Dodge, C. B., Co.
D. R. S. Labs.
DuPont, E. I., de Nemours & Co., Inc.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Hygiene Research Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Magnus Chemical Co., Inc.
McDonald, B. F., Co.
Milburn Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Packwood, G. H., Mfg. Co.
Pittsburgh Plate Glass Co.
Plasco Safety Products Co.
Quickee Products, Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Siladerm Laboratories
Standard Glove Co.
Vestal, Inc.
Wallace Optical Co., Inc.
West Disinfecting Co.

Hand Guards

Advance Glove Mfg. Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Eastern Safety Equipment Co.
General Scientific Equipment Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Jonsac, Inc.
Kennedy-Ingalls, V. E., Co.
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Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Tameo, Inc.
Wheeler Protective Apparel, Inc.

Handlines

Buhrke, R. H., Co.
Industrial Products Co.
Klein, Mathias, & Sons
Miller Equipment Co., Inc.
Seco Safety Products Co.

Hand Pumps

Blackmer Pump Co.
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Protectoseal Co., The
Smith, D. B., & Co., Inc.
Tokheim Corp.

Hangers, Lamp Lowering

Thompson Electric Co.

Harness, Industrial Safety

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Buhrke, R. H., Co.
Davis Emergency Equip. Co., Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Industrial Safety Belt Co.
Klein, Mathias, & Sons
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Seco Safety Products Co.
Standard Glove Co.
Wind-R or Automatic Safety Device Co.

Hat Liner

Bashlin, W. M., Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bungeleisen, Joseph, Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc., The
Dockson Corp.
Eastern Safety Equipment Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
General Textile Mills, Inc.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Halperin, A. E., Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Jackson Products
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Hats and Caps, Safety

Aljay Mfg. Co., Inc.
American Ailsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Davids Gloves, Inc.
Davis Emergency Equip. Co., Inc., The
Dockson Corp.
Eastern Safety Equipment Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
General Textile Mills, Inc.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Jackson Products
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Willson Products, Inc.
Wheeler Protective Apparel, Inc.

Hearing Aid

Beltone Hearing Aid Co.
Malco Co., Inc., The

Hearing Protectors

Sigma Engineering Co.

Heating Pads

Brenton Equip. Co.
Halperin, A. E., Co., Inc.
Interstate Rubber Products Co.
Karel First Aid Supply Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.

Helmets, Firemen's

American Ailsafe Co., Inc.
American-LaFrance Corp.
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
Fibre-Metal Products Co.
General Scientific Equipment Co.
General Textile Mills, Inc.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Wheeler Protective Apparel, Inc.

Helmets, Sandblast

American Optical Co. - Safety Div.
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equip. Co., Inc., The
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Helmets, Welding

American Ailsafe Co., Inc.
American Industrial Safety Equip. Co.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Davis Emergency Equip. Co., Inc.
Dockson Corp.
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Jackson Products
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Welsh Mfg. Co.
Willson Products, Inc.

Hoisting Buckets

Buhrke, R. H., Co.
Industrial Products Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Hoists, Chain

Cleveland Tramrail Div., The
Cleveland Crane & Engineering Co
Columbus-McKinnon Chain Corp.
Chisholm-Moore Hoist Div.
Robbins & Myers, Inc.
Wright Hoist Div., American
Chain & Cable Co.

Hoods, Acid

Advance Glove Mfg. Co.
American Ailsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
Davis Emergency Equip. Co., Inc.
Fibre-Metal Products Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Wagco Products, Inc.

Hoods, Dust

Advance Glove Mfg. Co.
American Ailsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Chicago Eye Shield Co.
DeWalt, Inc.
Dockson Corp.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Milburn Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plastimayd Products Corp.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Sawyer Safety Products Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Wagco Products, Inc.
Willson Products, Inc.

Hoods, Enameler's

Advance Glove Mfg. Co.
Boyer-Campbell Co., The
Bullard, E. D., Co.
Dockson Corp.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.

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Industrial Gloves Co.
Industrial Products Co.
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McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Sawyer Safety Products Co.
Standard Safety Equipment Co.

Hoods, Insulator

Advance Glove Mfg. Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety First Supply Co.
Salisbury, W. H., & Co.
Wheeler Protective Apparel, Inc.

Hooks, Hoisting

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Brewer-Titchener Corporation, The
Buhrke, R. H., Co.
Bullard, E. D., Co.
General Machine & Welding Works, Inc.
General Scientific Equipment Co.
Industrial Products Co.
Klein, Mathias, & Sons
Laughlin, Thomas, Div., American Hoist & Derrick Co.
MacWhyte Co.
Newman Mfg. & Sales Co.
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Taylor, S. G., Chain Co.
Walpole Co. The

Hooks, Safety Belt

Brenton Equip. Co.
Buhrke, R. H., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Industrial Safety Belt Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Hose, Lines

Genter, C. D., Co.
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Goodyear Industrial Products, Co., Inc.
Miller Products Co., Inc.
Salisbury, W. H., & Co.

Hose, Steam

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Goodrich, B. F., Co.
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Carbide & Carbon Chemicals Co.

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Davis Emergency Equip. Co., Inc.
Johnson-Williams, Inc.
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I

Ice Control Materials

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Inclinators, Carboy

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Industrial Products Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Index of Codes, Standards and References

Loss Control Associates

Indicators, Carbon Monoxide

Boyer-Campbell Co., The
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
Fisher Scientific Co.
Kruger, Harold, Instruments
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Taller & Cooper, Inc.
U. S. Safety Service Co.

Indicators, Flammable Vapors

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General Scientific Equipment Co.
Johnson-Williams Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Taller & Cooper, Inc.

Indicators, Gas

Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
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Kruger, Harold, Instruments
Johnson-Williams, Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
National Mine Service Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Taller & Cooper, Inc.
U. S. Safety Service Co.

Indicators, Oxygen Deficiency

Brenton Equip. Co.
Davis Emergency Equip Co., Inc.
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Mine Safety Appliances Co.
New Jersey Safety Equip. Co.

Industrial Sound Control

Beltone Hearing Aid Co.
Hanson, Elof, Inc.
Industrial Acoustics Co., Inc.
Industrial Sound Control
Mine Safety Appliances Co.
Scott, Herman Hosmer, Inc.

Inhalators

American-LaFrance Corp.
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Davis Emergency Equip. Co., Inc.
E & J Mfg. Co.
Emergency Oxygen Inhalators, Inc.
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Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
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New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Stephenson Corp.

Insect Repellent

Associated Just Distrs., Inc.
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Bullard, E. D., Co.
Carbide & Carbon Chemicals Co.
Davis Emergency Equipment Co., Inc.
Fuld Bros., Inc.
Halperin, A. E., Co., Inc.
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Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.

Insecticides

Associated Just Distrs., Inc.
Brulin & Co., Inc.
Bullard, E. D.
Diversey Corp.
Dolge, C. B., Co.
Dow Chemical Co.
DuPont, E. I. de Nemours & Co., Inc.
Finnell System, Inc.
Fuld Bros., Inc.
Halperin, A. E., Co., Inc.
Hillyard Chemical Co.
Huntington Laborstories, Inc.
Midland Laborstories
National Disinfectant Co.
West Disinfecting Co.

Insoles

Brenton Equip. Co.
Bullard, E. D., Co.
General Textile Mills, Inc.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Rubberhide Co., Inc.
Safety Clothing & Equipment Co.

Insulated Mobile Electrification

Insul-8-Corp.

Insulation

Eagle-Picher Co., The

Insulators Stools

Salisbury, W. H., & Co.

Insurance

Employers Mutual of Wausau

Intercommunication Equipment

Talk-A-Phone Co.

Interlock Systems, Doors, Gates, Manholes, Etc.

R & IE Equipment Div. of I-T-E Circuit Breaker Co.

Interlock Systems, Electric Circuits

R & IE Equipment Div. of I-T-E Circuit Breaker Co.

Interlock Systems, Valve Application

R & IE Equipment Div. of I-T-E Circuit Breaker Co.

K

Keys, Safety Chuck

Lindstrom Mfg. Co. Inc.

Knives, Safety

Flash Box Opener Co.
Flash Safety Knife Co.
Miller Equipment Co., Inc.
Scientific Industrial Supply Co., Inc.

L

Labels, Adhesive

American Allsafe Co., Inc.
Brady, W. H., Co.
Chart-Pak, Inc.
Custanite Corp.
Fisher Scientific Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Ready Made Sign Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Westline Products Div.

Ladder Climbers

Boyer-Campbell Co., The
Rose Mfg. Co.
Safety Clothing & Equipment Co.

Ladder Shoes or Feet

Aluminum Ladder Co.
American Abrasive Metals Co.
American Allsafe Co., Inc.
American Optical Co.
Babcock, W. W., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Dayton Safety Ladder Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goshen Mfg. Co., Inc.
H-B Industries, Inc.
Industrial Products Co.
Johnson Ladder Shoe Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Meiflex Products Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Newton Engineering Service
Patent Scaffolding Co., Inc.
Pulmosan Safety Equipment Corp.
Putnam Rolling Ladder Co., Inc.
Rolas Products Corp.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.

Ladders, Aluminum

Aluminum Ladder Co.
American-LaFrance Corp.
Ballymore Co.
Bullard, E. D., Co.
Genter, C. D., Co.
Louisville Ladder Co.
McDonald, B. F., Co.
Patent Scaffolding Co., Inc.
Pittsburgh Plate Glass Co.
Putnam Rolling Ladder Co., Inc.
Rol-Away Truck Mfg. Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Sobrill, J. B., Corp.
Werner, R. D., Co., Inc.

Ladders, Rolling

Aluminum Ladder Co.
Ballymore Co.
Bil-Jax, Inc.
Cotterman, I. D.
Cramer Posture Chair Co.
Dayton Safety Ladder Co.
Louisville Ladder Co.
Pittsburgh Plate Glass Co.
Putnam Rolling Ladder Co., Inc.
Safe-Lad Mfg. Co.
Safway Steel Products, Inc.
Sobrill, J. B., Corp.

See directory of Safety Equipment Sources for addresses.

classified safety product index

Ladders, Safety

Aluminum Ladder Co.
American Allsafe Co., Inc.
Babcock, W. W., Co.
Ballymore Co.
Beaudeal Inc.
Bil-Jax, Inc.
Bullard, E. D., Co.
Bustin Steel Products, Inc.
Cotterman, I. D.
Dayton Safety Ladder Co.
Genter, C. D., Co.
Goshen Mfg. Co., Inc.
Patent Scaffolding Co., Inc.
Pittsburgh Plate Glass Co.
Putnam Rolling Ladder Co., Inc.
Rol-Away Truck Mfg. Co., Inc.
Rolas Products Corp.
Safety Clothing & Equipment Co.
Sebrell, J. B., Corp.
Seco Safety Products Co.
Tri-Metal Products Co.
Werner, R. D., Co., Inc.

Ladders, Step, Safety

Werner, R. D., Co., Inc.

Ladders, Tower Safety

Aluminum Ladder Co.
American Allsafe Co., Inc.
Bil-Jax, Inc.
Patent Scaffolding Co., Inc., The
Safety Tower Ladder Co.
Safway Steel Products, Inc.

Laminated Tapes

Chart-Pak, Inc.

Lamp Guards

Browne, Stewart R., Mfg. Co., Inc.
Electric Cord Co.
Ericson Mfg. Co., The
General Scientific Equipment Co.
Gets-A-Lite Co.
Industrial Products Co.
Standard Safety Equipment Co.
U-C Lite Mfg. Co.

Lamp Hangers

Thompson Electric Co.

Lamp Shock Absorbers

Thompson Electric Co.

Lamps, Adjustable

Dazor Mfg. Corp.
Electric Cord Co.
Fostoria Pressed Steel Corp.
Halperin, A. E., Co., Inc.
Luxo Lamp Corp.
Swiveller Co., Inc.

Lamps, Electric

Davis Emergency Equip. Co., Inc.
Dazor Mfg. Corp.
Luxo Lamp Corp.
McDonald, B. F., Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Lamps, Emergency

American Optical Co.
Carpenter Mfg. Co.
Dual-Lite Co.
Electric Cord Co.
Exide Industrial Div., Electric Storage & Battery Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Pyle-National Co.
Safety Clothing & Equipment Co.
Standard Electric Time Co.
U-C Lite Mfg. Co.

Lamps, Explosion Proof

Boyer-Campbell Co., The
Brenton Equip. Co.
Browne, Stewart R., Mfg. Co., Inc.
Electric Cord Co.
General Scientific Equipment Co.
Justrite Manufacturing Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pyle-National Co.
Safety Clothing & Equipment Co.
U-C Lite Mfg. Co.

Lamps, Extension

Browne, Stewart R., Mfg. Co., Inc.
Electric Cord Co.
Ericson Mfg. Co., The
Industrial Products Co.
Luxo Lamp Corp.
McGill Mfg. Co.
New Jersey Safety Equip. Co.
Searjeant Metal Products, Inc.

Lamps, Miners'

Bullard, E. D., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
National Mine Service Co.

Lamps, Portable Electric

Browne, Stewart R., Mfg. Co., Inc.
Dazor Mfg. Corp.
Dual-Lite Co., Inc.
Electric Cord Co.
Ericson Mfg. Co., The
Industrial Products Co.
Justrite Manufacturing Co.
Luxo Lamp Corp.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pyle-National Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Sittler Corp.
U-C Lite Mfg. Co.

Lamps, Safety

Boyer-Campbell Co., The
Browne, Stewart R., Mfg. Co., Inc.
Bullard, E. D., Co.
Electric Cord Co.
Fostoria Pressed Steel Co.
General Scientific Equipment Co.
Hindle Transformer Co., Inc.
Industrial Products Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
National Mine Service Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
U-C Lite Mfg. Co.

Lanterns, Carbide

Brenton Equip. Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
Safety Clothing & Equipment Co.

Lanterns, Electric

American-LaFrance Corp.
Brenton Equip. Co.
Dual-Lite Co., Inc.
Electric Cord Co.
Industrial Products Co.
Justrite Mfg. Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
U-C Lite Mfg. Co.

Lanyards

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Buhrke, R. H., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Rose Mfg. Co.
Safety Clothing & Equipment Co.

Leathers, Hand

Advance Glove Mfg. Co.
Aljay Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Davids Gloves, Inc.
Gebhardt, A. L., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Leather Preserver, Water Repellent

American Allsafe Co., Inc.
Bullard, E. D., Co.
Dow Corning Corp.
DuPont, E. I., de Nemours & Co., Inc.
Gebhardt, A. L., Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Industrial Gloves Co.
McDonald, B. F., Co.
Record Industrial Co.
Rochester Safety Equipment Co.
Safety Clothing & Equipment Co.
Standard Glove Co.
Standard Safety Equipment Co.

Leather, Safety Clothing

Advance Glove Mfg. Co.
Aljay Mfg. Co.
American Allsafe Co., Inc.
American Optical Co. - Safety Div.
Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Central Safety Equipment Co.
Davids Gloves, Inc.
Eastern Safety Equipment Co.
Fibre-Metal Products Co.
Gebhardt, A. L., Co.
General Scientific Equipment Co.
General Split Corp.
Genter, C. D., Co.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Singer Glove Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Leggings

Advance Glove Mfg. Co.
Aljay Mfg. Co., Inc.
American Allsafe Co., Inc.
American Optical Co. - Safety Div.
Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Davids Gloves, Inc.
Ellwood Safety Appliance Co.
Frommeit Industries
General Scientific Equipment Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc., The
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Lens Cleaner

Acme Protection Equipment Co.
American Allsafe Co., Inc.
American Optical Co. - Safety Div.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Buckley Corp.
Carhoff Co.
Dow Corning Corp.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Huntington Laboratories, Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
Kimberly-Clark Corp.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Silicone Paper Co. of America
Standard Glove Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.
Vestal, Inc.
Wallace Optical Co., Inc.
Wilkins Co., Inc.
Willson Products, Inc.

Lens, Industrial

American Industrial Equipment Co.
American Optical Co. - Safety Div.
Armorlite Lens Co., Inc.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Carhoff Co.
Chicago Eye Shield Co.
Dockson Corp.
Eastern Safety Equipment Co.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.

To locate Advertisements, see Advertisers' Index.

U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Willson Products, Inc.

Lens Inspection

American Optical Co. - Safety Div.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Lens, Prescription

American Optical Co.
Armorlite Lens Co., Inc.
Bausch & Lomb Optical Co.
Chicago Eye Shield Co.
Fendall Co.
Genter, C. D., Co.
Kimball Safety Products
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Sellstrom Mfg. Co.
Standard Glove Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Lifeline Lock for Scaffolds, Swings

Miller Equipment Co., Inc.
Rose Mfg. Co.
Safety Tower Ladder Co.

Lifters, Vacuum

Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Central Safety Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Littell, F. J., Machine Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.

Liftgates, Hydraulic

Anthony Co.
Midwest Body & Mfg.

Lifting Equipment

Boyer-Campbell Co.
Economy Engineering Co.
Hamilton Tool Co.
Industrial Products Co.
Raymond Corp., The
Searjeant Metal Products, Inc.

Lifting Equipment, Industrial

Electric Cord Co.
General Machine & Welding Works, Inc.
Hamilton Tool Co.
Ingersoll-Rand Co.
Karel First Aid Supply Co.
Luxo Lamp Corp.
McGill Mfg. Co.
Raymond Corp., The
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Swiveller Co., Inc.

Lifting Equipment, Industrial, Magnetic

Multifinish Mfg. Co.

Lifting Equipment, Magnetic

Multifinish Mfg. Co.

Lighting, Outdoor

Electric Cord Co.
Pyle-National Co.
Swiveller Co., Inc.
Thompson Electric Co.

Lighting Units, Portable

Carpenter Mfg. Co.
Dazor Mfg. Corp.
Dual-Lite Co., Inc.
Electric Cord Co.
Ericson Mfg. Co., The
Exide Industrial Div., The Electric Storage Battery Co.
Karel First Aid Supply Co.
Luxo Lamp Corp.
McDonald, B. F., Co.
New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Swiveller Co., Inc.
U-C Lite Mfg. Co.

Lights Emergency, Battery

American Optical Co.
Browne, Stewart R., Mfg. Co.
Carpenter Mfg. Co.
Davis Emergency Equip. Co., The
Dual-Lite Co.
Electric Cord Co.
Emarco Corp.
Exide Industrial Div., Electric Storage Battery Co.
General Scientific Equipment Co.
Industrial Products Co.
Justrite Mfg. Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Prairie State Products Co.
Safety Clothing & Equipment Co.
Seco Safety Products Co.
Standard Electric Time Co.
U-C Lite Mfg. Co.
Vari-Products Co.

Lights, Emergency Vehicle

Bomgardner Mfg. Co.
Carpenter Mfg. Co.
Davis Emergency Equipment Co., Inc.
Emarco Corp.
Federal Sign & Signal Corp.
General Scientific Equipment Co.
Pyle-National Co.
Sterling Siren Fire Alarm Co., Inc.
Swiveller Co., Inc.
U-C Lite Mfg. Co.
Vari-Products Co.

Lights, Warning

Browne, Stewart R., Mfg. Co., Inc.
Carpenter Mfg. Co.
Davis Emergency Equipment Co., Inc.
Electric Cord Co.
Emarco Corp.
Federal Sign & Signal Corp.
General Scientific Equipment Co.
Genter, C. D., Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Prairie State Signal Co.
Pyle-National Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
U-C Lite Mfg. Co.
Vari-Products Co.

Line Hose

Salisbury, W. H., & Co.

Line Markers

Boyer-Campbell Co., The
Brady, W. H., Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Industrial Products Co.
M-B Corp.
New Jersey Safety Equipment Co.
Searjeant Metal Products, Inc.
Standard Safety Equipment Co.

Linemen's Rubber Protective Devices

Brenton Equip. Co.
Central Safety Equipment Co.
Charleston Rubber Co.
Davis Emergency Equipment Co., Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
McDonald, B. F., Co.
Miller Products Co., Inc.
Olympic Glove Co., Inc., The
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.
Standard Glove Co.
Surety Rubber Co.

Linemen's Tools

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Klein, Mathias & Sons
Miller Equipment Co., Inc.
Safety First Supply Co.
Wolverine Shoe & Tanning Corp.

Load Binders

American Logging Tool Corp.
Broderick & Bascom Rope Co.
Canton Mfg. Co.
Laughlin, Thomas Div. American Hoist & Derrick Co.
Texas Foundries

Lockers and Hangers for Clothing

Safety Clothing & Equipment Co.
Safety First Supply Co.

Lock-Outs, Electric Switch

Central Safety Equipment Co.
Industrial Products Co.
Osborn Mfg. Co.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.

Loudspeakers, Portable

Sound-Craft Systems

M

Magnifiers

Bausch & Lomb Optical Co.
Boyer-Campbell Co.
Custanite Corp.
Dazor Mfg. Corp.
Fisher Scientific Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sellstrom Mfg. Co.
Wallace Optical Co., Inc.

Maintenance Towers

General Machine & Welding Works, Inc.
Patent Scaffolding Co., Inc., The
Universal Mfg. Corp.

Markers, Traffic Line

American Allsafe Co., Inc.
Boyer-Campbell Co.
Bradbrook, A. N., Inc.
Brady, W. H., Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D.
Eastern Metals of Elmira, Inc.
Industrial Products Co.
M-B Corp.
McDonald, B. F., Co.
Miracle Adhesives Corp.
New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sargent-Sowell, Inc.
Searjeant Metal Products, Inc.
Stonehouse Signs, Inc.
Vari-Products Co.

Masks, Abrasive Blasting

Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co., Inc.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equip. Co.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Standard Glove Co.
Wallace Optical Co., Inc.

Masks, Acid Gas

Acme Protection Equipment Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Genter, C. D., Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Masks, All-Service

Acme Protection Equipment Co.
American-LaFrance Corp.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equip. Co., Inc.
Dockson Corp.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Halperin, A. E., Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Masks, Ammonia Gas

Acme Protection Equipment Co.
American-LaFrance Corp.
Boyer-Campbell Co., The
Brenton Equip. Co.
Davis Emergency Equip. Co., Inc.
General Scientific Equipment Co.
Genter, C. D., Co.

See directory of Safety Equipment Sources for addresses.

Halperin, A. E., Co., Inc.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Masks, Babbitting

Boyer-Campbell Co., The
Brenton Equip. Co.
Chicago Eye Shield Co.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.

Masks, Carbon Monoxide

Acme Protection Equipment Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Davis Emergency Equipment Co., Inc.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Seco Safety Products Co.
Standard Safety Equipment Co.
Willson Products, Inc.

Masks, Gas, Welding

Acme Protection Equipment Co.

Masks, Hose (Fresh Air)

Acme Protection Equipment Co.
American-LaFrance Corp.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Standard Safety Equipment Co.
Willson Products, Inc.

Masks, Hose (Supplied Air)

Acme Protection Equipment Co.
American Industrial Safety Equip. Co.
American-LaFrance Corp.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co., Inc.
Fibre-Metal Products Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Seco Safety Products Co.
Standard Safety Equipment Co.

Masks, Organic Vapor

Acme Protection Equipment Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Cover, H. S.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Eastern Safety Equipment Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Willson Products, Inc.

Matches, Safety

Diamond Match Co.
Universal Match Corp.

Materials Handling Devices

Bomgardner Mfg. Co.
Bullard, E. D., Co.
Cleveland Tramrail Div., Cleveland Crane & Engineering Co., The
DeWalt, Inc.
Economy Engineering Co.
Feedrail Corp.
Franklin, Bernard, Co., Inc.
Frommelt Industries
General Machine & Welding Works, Inc.
General Scientific Equipment Co.
Hamilton Tool Company
Industrial Products Co.
Kensico Mfg. Co., Inc.
Magline Inc.
Merrill, Bros.
Morse Mfg. Co., Inc.
New Jersey Safety Equipment Co.
Raymond Corp., The
Rol-Away Truck Mfg. Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.

Materials Handling Devices, Magnetic

Multifinish Mfg. Co.

Mats, Floor, Electric

Interstate Rubber Products Co.

Mats, Standing

American Mat Corp.
Boyer-Campbell Co., The
Brabrook, A. N., Inc.
Durable Mat Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Huntington Laboratories, Inc.
Industrial Products Co.
Meiflex Products Co.
Miller Products Co. Inc.
Mitchell Rubber Products Inc.
New York Belting & Packing Co.
Goabaug Rubber Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Superior Rubber Mfg. Co.
Wear Proof Mat Co.

Mats, Switchboard

Boyer-Campbell Co., The
Brabrook, A. N., Inc.
Brenton Equip. Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Industrial Products Co.
Meiflex Products Co.
Miller Products Co. Inc.
New York Belting & Packing Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., Co.
U. S. Rubber Co.
Wear Proof Mat Co.

Matting, Floor and Stair

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brabrook, A. N., Inc.
Bustin Steel Products, Inc.
Dameron Enterprises Inc.
Emerson, J. H., Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodrich, B. F., Co.
Goodyear Industrial Products Co., Inc.
Huntington Laboratories, Inc.
Industrial Products Co.
Klemp Metal Grating Corp.
Meiflex Products Co.
Miller Products Co. Inc.
Mitchell Rubber Products Inc.
New York Belting & Packing Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Superior Rubber Mfg. Co.
U. S. Rubber Co.
Wear-Proof Mat Co.

Mauls, Rubber

Johnson Ladder Shoe Co.

Mauls, Wood

Safety First Supply Co.

Mechanical Stirrup, Circulator

Albina Engine & Machine Works

Message Repeater

Cousino, Inc.
Mine Safety Appliances Co.

Metal, Expanded

American Abrasive Metals Co.

Meter, Sound-Survey

General Radio Co.
Mine Safety Appliances Co.
Scott, Herman Hosmer, Inc.

Mineral Wool Insulation

Eagle-Picher Co., The

Mirrors, Plant Traffic

Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Silver Troy Mirror Co.

Mobile First Aid Equipment

Bomgardner Mfg. Co.
Brenton Equip. Co.
Davis Emergency Equipment Co., Inc.
Karel First Aid Supply Co.
Mine Safety Appliances Co.

Mop Trucks

Finnell System, Inc.
Hild Floor Machine Co.
Huntington Laboratories, Inc.

Movers, Railway Car

American Logging Tool Corp.
Boyer-Campbell Co., The
Broderick & Bascom Rope Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Safety Equipment Co.

Mufflers, Noise Absorbing

Allied Witan Co., Inc.

N

Nets, Rope Safety

Boyer-Campbell Co., The
Bullard, E. D., Co.
Genter, C. D., Co.
Industrial Products Co.
Safety First Supply Co.

Noise Control

Sigma Engineering Co.

Non Sparking Tools

Beryllium Corp., The
Boyer-Campbell Co., The
Custanite Corp.
General Scientific Equipment Co.
McDonald, B. F., Co.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Scientific Industrial Supply Co., Inc.

Nozzles

Akron Brass Works, Inc.
Allen, W. D., Mfg. Co.
"Automatic" Sprinkler Corp. of America
American-LaFrance Corp.
Cardox Corp.
Central Safety Equipment Co.
John Bean Div., Food Machinery & Chemical Corp.
Genter, C. D., Co.
Johnson-March Corp.
McIntire, F. N., Brass Works, Inc
Seco Safety Products Co.

O

Office Layout

Chart-Pak, Inc.

Office Templates (Self Adhesive)

Chart-Pak, Inc.

Oil Cans, Long Handle

Scientific Industrial Supply Co., Inc.

Oilers, Precision

Eagle Mfg. Co.

Organization and Flow Charts

Chart-Pak, Inc.

Overload Cut-offs, Automatic, For Hoists & Cranes

Dillon, W. C., & Co., Inc.

Oxygen Breathing Apparatus

Acme Protection Equipment Co.
Aloe, A. S., Co.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Cycle-Flo Co.
Davis Emergency Equipment Co., Inc.
E & J Mfg. Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Stephenson Corp.

To locate Advertisements, see Advertisers' Index.

Oxygen Recorders

Aloe, A. S., Co.
Davis Emergency Equipment Co., Inc.
Fisher Scientific Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Safety First Supply Co.
Taller & Cooper, Inc.

Oxygen Therapy Apparatus

Aloe, A. S., Co.
Bomgardner Mfg. Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co., Inc.
E & J Mfg. Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Stephenson Corp.

P

Pacs, Miners

Brenton Equip. Co.
Genter, C. D., Co.
Iron Age Safety Shoes
McDonald, B. F., Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
U. S. Rubber Co.

Padlocks

Corbin Cabinet Lock Div., American Hardware Corp.
Genter, C. D., Co.
Master Lock Co.

Pads, Knee

Advance Glove Mfg. Co.
Allied Glove Co.
American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Industrial Safety Belt Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Standard Safety Equipment Co.
Standard Glove Co.
Wheeler Protective Apparel, Inc.

Paint

DuPont, E. I., deNemours & Co., Inc.
Frost Paint & Oil Corp.
Kelley-Mahorney Co.
Kennedy-Ingalls, V. E., Co.
Magnus Chemical Co., Inc.
Oil-Dri Corp. of America
Phillip-Carey Manufacturing Co.
Pittsburgh Plate Glass Co.

Paint, Abrasive Resurfacing

American Abrasive Metals Co.
Boyer-Campbell Co., The
DuPont, E. I., de Nemours & Co., Inc.
Frost Paint & Oil Corp.
Genter, C. D., Co.
Hallemite Mfg. Co.
Kelley-Mahorney Co.
Kennedy-Ingalls, V. E., Co.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
McDonald, B. F., Co.
Miracle Adhesives Corp.
Moore, John B., Corp.
New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.

Paint Removers—Non-Flammable

Turco Products, Inc.

Paper Cups

Continental Can Co.
Dixie Cup Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
Medical Supply Co.
U. S. Envelope Co.

Parallels, Safety

Jerico

Parts, Cleaning Equipment

Homestead Valve Mfg. Co.
Kelite Corp.
Magnus Chemical Co., Inc.
Moore, John B., Corp.
Practical Mfg. Co.
Protectoseal Co., The
Tect, Inc.

Partitions, Rolling

Kinnear Mfg. Co.

Pipe Coverings

Eagle-Picher Co., The

Pipe Markers

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brady, W. H., Co.
Brenton Equip. Co.
Eastern Metals of Elmira, Inc.
Industrial Products Co.
Matthews, Jas. H., & Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Standard Safety Equipment Co.
Westline Products Div.
Wilmington Plastics Co.

Planning Boards & Sheets

Chart-Pak, Inc.

Plant Design & Construction

Chart-Pak, Inc.

Plastics for Shields and Guards

Boyer-Campbell Co., The
Dockson Corp.
DuPont, E. I., de Nemours & Co., Inc.
Fibre-Metal Products Co.
General Scientific Equipment Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Sellstrom Manufacturing Co.
Standard Safety Equipment Co.
Wilmington Plastics Co.

Platforms, Scaffold

Albins Engine & Machine Corp.
Aluminum Ladder Co.
Atlas Industrial Corp.
Baker-Roos, Inc.
Bil-Jax, Inc.
Economy Engineering Co.
General Machine & Welding Works, Inc.
Globe Co., Grip-Strut Div.
Goshen Mfg. Co., The, Inc.
Louisville Ladder Co.
Patent Scaffolding Co., Inc.
Safway Steel Products, Inc.

Platforms, Steel

Alan Wood Steel Co.
Ballymore Co.
Bil-Jax, Inc.
Bustin Steel Products, Inc.
Globe Co., Grip-Strut Div.
Inland Steel Co.
Kemp Metal Grating Corp.
Nichols Engineering Co., The
Safe-Lad Mfg. Co.

Platforms, Tank Car

Bil-Jax, Inc.
Bustin Steel Products, Inc.
Magline Inc.
Nichols Engineering Co.

Platforms, Unloading

Bil-Jax, Inc.
Bustin Steel Products, Inc.
Magline Inc.
Nichols Engineering Co.

Pliers, Safety

Beryllium Corp.
Boyer-Campbell Co.
Brenton Equip. Co.
General Scientific Equipment Co.
New Jersey Safety Equipment Co.
Osborn Mfg. Co.
Safety Clothing & Equipment Co.
Searjeant Metal Products, Inc.
Standard Safety Equipment Co.

Poison Ivy Treatments

Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
D.R.S. Labs.
Halperin, A. E., Co., Inc.
I. D. U. Products Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Seco Safety Products Co.

Pole Grip, Safety

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
Industrial Products Co.
Petersen Engineering Co.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Standard Safety Equipment Co.

Poster Service

Elliott Service Co., Inc.
Embossograf Corp. of America
National Safety Council
Organization Services, Inc.
Protectoseal Co., The
Willson Products, Inc.

Power Press Safety Controls Kits

Boyer-Campbell Co., The
National Pneumatic Co., Inc. & Hotliner-Cabot Divisions
Searjeant Metal Products, Inc.

Pressure Sensitive Tapes

Chart-Pak, Inc.

Projector, Automatic and Continuous

American Optical Co.
DuKane Corp.
Poster Slides

Projectors, Film Strip

American Optical Co.
Bausch & Lomb Optical Co.
DuKane Corp.
Eastman Kodak Co.
Magnavox Corp.

Projectors, Motion Picture

Ampro Corp.
Bass Camera Co., Inc.
Bell & Howell
Colburn, Geo. W., Labs., Inc.
DeVry Corp.
Eastman Kodak Co.
Modern Talking Picture Service
Radio Corp. of America
Sarra, Inc.
Victor Animatograph Corp.
Young America Films, Inc.

Projectors, Sound Slidefilm

DuKane Corp.

Promotional Material, Safety

American Optical Co. - Safety Div. Discussion
National Safety Council, Part 2
Organization Services, Inc.
Protectoseal Co., The
Ready Made Sign Co., Inc.

Protectors, Arm

American Allsafe Co., Inc.
American Optical Co. - Safety Div.
Boyer-Campbell Co., The
Brenton Equip. Co.
Charleston Rubber Co.
General Bandage, Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Kimball Safety Products
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Protectors, Ear

American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Industrial Products Co.
Karel First Aid Supply Co.
Kimball Safety Products
Lee Sonic Ear-valv.
Maico Co., Inc., The
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety Ear Protector Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Sigma Engineering Co.
Standard Safety Equipment Co.
Surgical Mechanical Research, Inc.

Protectors, Finger

American Allsafe Co., Inc.
American Optical Co. - Safety Div.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
General Bandages, Inc.
Goodyear Industrial Products Co., Inc.
Industrial Gloves Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Miller Products Co. Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Record Industrial Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.
Wilson Rubber Co.

Protectors for Linemen

Bashlin, W. M., Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Charleston Rubber Co.
Davis Emergency Equipment Co., Inc.
Industrial Gloves Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Salisbury, W. H., & Co.

See directory of Safety Equipment Sources for addresses.

Protectors, Knee

American Allsafe Co., Inc.
Boyer-Campbell Co.
Brenton Equip. Co.
Kilwood Safety Appliance Co.
Industrial Gloves Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc., The
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Protector's Wire Rope

Newman Mfg. & Sales Co.

Publications, Safety

Elliott Service Co., Inc.
National Safety Council
Noise Control
Organization Services, Inc.
Protectoseal Co., The

Pumps, Acid

American Allsafe Co., Inc.
Ampco Metal, Inc.
Bean, John, Division Food Machine & Chemical Corp.
Blackmer Pump Co.
Brenton Equip. Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Industrial Products Co.
Ingersoll-Rand Co.
Miller Products Co. Inc.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Robbins & Myers, Inc.
Safety Clothing & Equipment Co.
Seco Safety Products Co.
Standard Safety Equipment Co.

Pumps, Foam

Cardox Corp.
Central Safety Equipment Co.

Pumps, Hand Operated

Acme Protection Equipment Co.
Blackmer Pump Co.
Davis Emergency Equipment Co., Inc.
General Scientific Equipment Co.
Industrial Products Co.
New Jersey Safety Equipment Co.
Practical Mfg. Co.
Protectoseal Co., The
Seco Safety Products Co.
Smith, D. R., & Co., Inc.
Tokheim Corp.

Pumps, Oxygen

McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety First Supply Co.

R

Racks, Barrel

Baker-Roos, Inc.
Bethlehem Steel
Economy Engineering Co.
Huntington Laboratories, Inc.
Industrial Products Co.
Morse Mfg. Co., Inc.
New Jersey Safety Equip. Co.

Radiation Detectors

Curtiss-Wright Corp.
McDonald, B. F., Co.

Rail Punch

Mine Safety Appliances Co.

Ramps and Runways

Alan Wood Steel Co.
Bil-Jax, Inc.
Bustin Steel Products, Inc.
Globe Co., Grip-Strut Div.
Kemp Metal Grating Corp.
Searjeant Metal Products, Inc.

Reels, Cord Extension

Ericson Mfg. Co., The

Reels, Static Discharge

Ericson Mfg. Co., The

Reels, Welding Hose

Genter, C. D., Co.
United Specialty Corp.

Reels, Wire

Genter, C. D., Co.
Ideal Reel Co.
United Specialty Corp.

Reflectors, Lamp

Prairie State Products Co.
Safety Clothing & Equipment Co.

Regulators, Gas

American Industrial Safety Equip. Co.
Cash, A. W., Valve Mfg. Corp.
Dockson Corporation
Safety First Supply Co.

Rescue Apparatus, Diving and Underwater

Bomgardner Mfg. Co.
Davis Emergency Equipment Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Scott Aviation Corp.

Rescue Suits

Brenton Equip. Co.
Bullard, E. D., Co.
Far-Ex Corp.
General Scientific Equipment Co.
Industrial Gloves Co.
Kennedy-Ingalls, V. E., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Seco Safety Products Co.
Wheeler Protective Apparel, Inc.

Respirators, Air-Line

Acme Protection Equipment Co.
American Optical Co.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Eastern Safety Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Seco Safety Products Co.
Standard Safety Equipment Co.
Willson Products, Inc.

Respirators, Fume

American Industrial Safety Equip. Co.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Eastern Safety Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Respirators, Gas

Aloe, A. S., Co.
American Optical Co.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Corp.
Safety First Supply Co.
Scott Aviation Corp.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Respirators, Dust—Type A

Aloe, A. S., Co.
American Industrial Safety Equip. Co.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Cover, H. S.
Davis Emergency Equipment Co., Inc.
DeVilbiss Co.
Dockson Corp.
Dunn Products
Eastern Safety Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Respirators, Dust—Type A and Lead-Combination

American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Cover, H. S.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Dunn Products
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Respirators, Dust—Lead

American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Cover, H. S.
Davis Emergency Equipment Co., Inc.
Dockson Corp.
Dunn Products
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
McDonald, B. F., Co.
Michell Mfg. Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co., Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Respirators, Mists

Aloe, A. S., Co.
American Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Cover, H. S.
Davis Emergency Equipment Co., Inc.
DeVilbiss Co.
Dockson Corp.
Eastern Safety Equipment Co.
Fisher Scientific Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Sellstrom Mfg. Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Resuscitation Equipment

Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Cycle-Flo Co.
Davis Emergency Equipment Co., Inc.
E & J Mfg. Co.
Emergency Oxygen Inhalators, Inc.
Emerson, J. H., Co.
General Scientific Equipment Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
McDonald, B. F., Co.

To locate Advertisements, see Advertisers' Index.

Medical Supply Co.
Midwest Oxygen Equip. Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scott Aviation Corp.
Stephenson Corp.

Rock Dusters

Mine Safety Appliances Co.
Smith, D. B., & Co., Inc.

Rope Grab, Life Line

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Standard Safety Equipment Co.

Rope, Wire

American Chain & Cable Co.
Bethlehem Steel Co.
Broderick & Bascom Rope Co.
Buhrke, R. H., Co.
Colorado Fuel & Iron Co.
Genter, C. D., Co.
Jones-Laughlin Steel Corp.
Macwhyte Co.
Miller Equipment Co., Inc.
Union Wire Rope Corp.
Wire Rope Corp. of America, Inc.

S

Safety Chuck Keys

Boyer-Campbell Co., The
Lindstrom Mfg. Co.

Safety Crutch Tips

Halperin, A. E., Co., Inc.
Johnson Ladder Shoe Co.

Safety Device, Tower Ladders

Safety Lifeline Lock Co.
Safety Tower Ladder Co.

Safetygraphs

Chart-Pak, Inc.
National Safety Council

Safety Hooks

American Chain & Cable Co.
Boyer-Campbell Co., The
Brewer-Titchener Corp., The
Buhrke, R. H., Co.
Bullard, E. D., Co.
General Machine & Welding Works, Inc.
General Scientific Equipment Co.
Industrial Products Co.
Laughlin, Thomas, Div., American Hoist & Derrick Co.
Mathias Klein & Sons
Macwhyte Co.
McDonald, B. F., Co.
Miller Equipment Co., Inc.
Newman Mfg. & Sales Co.
Safety Clothing & Equipment Co.
Taylor, S. G., Chain Co.
Walpole Co., The

Safety Lathe Wrenches

Lindstrom Mfg. Co.

Safety Training

Discussion
Universal Match Corp.

Safety Training Institute

National Safety Council

Safety Truck Steps

American Abrasive Metals Co.
Bullard, E. D., Co.
Bustin Firm Grip Grating Co.
Industrial Products Co.
Rol-Away Truck Mfg. Co., Inc.

Salt Tablets

Ace Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co., Inc.
D.R.S. Labs.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
International Salt Co., Inc.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Morton Salt Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.

Salt Tablet Dispenser

Ace Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equipment Co., Inc.
General Scientific Equipment Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
International Salt Co., Inc.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medical Supply Co.
Mine Safety Appliances Co.
Morton Salt Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Standard Safety Equipment Co.
U. S. Safety Service Co.

Sand Blast Equipment

Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Charleston Rubber Co.
Genter, C. D., Co.
Industrial Gloves Co.
McDonald, B. F., Co.
Miller Products Co. Inc.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Ruemelin Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Safety Equipment Co.
Wheelabrator Corp.

Sandals, Non-Skid

Associated Bag & Apron Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
General Scientific Equipment Co.
Genter, C. D., Co.
New Jersey Safety Equip. Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Standard Safety Equipment Co.

Sandals, Shower

American Allsafe Co., Inc.
Associated Bag & Apron Co.
Boyer-Campbell Co., The
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
New Jersey Safety Equipment Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Scientific Industrial Supply Co.

Sandals, Wooden Sole

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equipment Co.
General Scientific Equipment Co.
Genter, C. D., Co.
Industrial Products Co.
Industrial Safety Belt Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Standard Safety Equipment Co.

Saw, Portable

Boyer-Campbell Co., The
DeWalt, Inc.
Wachs, E. H., Co.

Scaffold, Jacks

Bil-Jax, Inc.
Goshen Mfg. Co., Inc.
Patent Scaffolding Co., Inc.
Pittsburgh Plate Glass Co.
Safway Steel Products, Inc.
Waco Mfg. Co.

Scaffolding, Rolling

Atlas Industrial Corp.
Baker-Ross, Inc.
Bil-Jax, Inc.
Economy Engineering Co.
Patent Scaffolding Co., Inc., The
Pittsburgh Plate Glass Co.
Safway Steel Products, Inc.
Waco Mfg. Co.

Scaffolding, Safety

Atlas Industrial Corp.
Baker-Ross, Inc.
Beaver Art Metal Corp.
Bil-Jax, Inc.
Economy Engineering Co.
Globe Co., Grip-Strut Div.
Patent Scaffolding Co., Inc.
Pittsburgh Plate Glass Co.
Safety First Supply Co.
Safway Steel Products, Inc.
Steel Scaffolding Co.
Universal Mfg. Corp.
Waco Mfg. Co.
Werner, R. D., Co., Inc.
Wind-Kor Automatic Safety Device Co.

Scrubbing Machines, Floor

Clarke Sanding Machine Co.
Finnell System Inc.
Hild Floor Machine Co.
Huntington Laboratories, Inc.
Kent Co., Inc.
Masury-Young Co.
Pittsburgh Plate Glass Co.
Tennant, G. H., Co.

Seal for Fire Extinguishers

Genter, C. D., Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.

Searchlights

New Jersey Safety Equip. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
U-C Lite Mfg. Co.

Self-Rescuers for Miners

Davis Emergency Equip. Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.

Sheet Lifters, Magnetic

Multifinish Mfg. Co.

Sheet Lifters, Vacuum

Boyer-Campbell Co., The
Hamilton Tool Co.
Industrial Products Co.
Littell, F. J., Machine Co.
Safety Clothing & Equip. Co.

Shield, Welding

American Optical Co.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Central Safety Equip. Co.
Chicago Eye Shield Co.
Duckson Corp.
Fibre-Metal Products Co., The
Frommelt Industries
General Scientific Equip. Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Industrial Products Co.
Jackson Products
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Welsh Mfg. Co.

Shin Guards

Advance Glove Mfg. Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Ellwood Safety Appliance Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Standard Safety Equipment Co.
Wheeler Protective Apparel, Inc.

Shirts, Anatomical

Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.

Shoe Preserver, Water Repellent

American Allsafe Co., Inc.
Bullard, E. D., Co.
Dow Corning Corp.
Halperin, A. E., Co., Inc.
Iron Age Safety Shoe Div., H. Childs & Co., Inc.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Rochester Safety Equipment Co.
Safety Clothing & Equip. Co.
Standard Safety Equipment Co.

Shoes, Conductive

Conductive Hospital Accessories Corp.
Hy-Test Safety Shoes, Div. International Shoe Co.
Lehigh Safety Shoe Co.

Shoes, Leather, Linemen's

Bashlin, W. M., Co.
Hy-Test Safety Shoes, Div. International Shoe Co.
Miller Equipment Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Wolverine Shoe & Tanning Corp.

See directory of Safety Equipment Sources for addresses.

classified safety product index

Shoes, Non-Sparking

Hy-Test Safety Shoes, Div. International Shoe Co.
Iron Age Safety Shoe Div., H. Childs & Co., Inc.
Lehigh Safety Shoe Co.
Mine Safety Appliances Co.
Record Industrial Co.
Wolverine Shoe & Tanning Corp.

Shoes, Orthopedic, Wooden Sole

Karel First Aid Supply Co.
New Jersey Safety Equip. Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equip. Co.

Shoes, Rubber, Safety Toe

Beacon Falls Rubber Footwear
Brenton Equip. Co.
Dunn Products
General Scientific Equip. Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Industrial Products Co.
Iron Age Safety Shoe Div., H. Childs & Co., Inc.
Lehigh Safety Shoe Co.
McDonald, B. F., Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
Record Industrial Co.
Safety Clothing & Equip. Co.
Scientific Industrial Supply Co., Inc.
Standard Glove Co.
U. S. Rubber Co.

Shoes, Safety Toe

Bone-Dry Shoe Mfg. Co.
Brenton Equip. Co.
Dorsey Saf-T Shoe Co.
General Shoe Corp. Sentry Shoe Co. Div.
Genter, C. D., Co.
Holland-Racine Shoes, Inc.
Hy-Test Safety Shoes, Div. International Shoe Co.
Iron Age Safety Shoe Div., H. Childs & Co., Inc.
Lehigh Safety Shoe Co.
McAn, Thom, Safety Shoes Div.
Mine Safety Appliances Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety First Shoe Co.
Wolf, Harry J., Shoe Co.
Wolverine Shoe & Tanning Corp.

Shoes for Women

Hy-Test Safety Shoes, Div. International Shoe Co.
Iron Age Safety Shoe Div., H. Childs & Co., Inc.
Record Industrial Co.
Reece Wooden Sole Shoe Co.

Shoes, Wooden Sole

Allied Glove Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equip. Co.
Record Industrial Co.
Reece Wooden Sole Shoe Co.
Safety Clothing & Equip. Co.
Scientific Industrial Supply Co., Inc.
Standard Safety Equipment Co.

Shower Baths, Industrial

Boyer-Campbell Co., The
Bradley Washfountain Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Haws Drinking Faucet Co.
Industrial Products Co.
New Jersey Safety Equipment Co.
Speakman Co.

Shower, Emergency

American Allsafe Co., Inc.
Benson & Associates
Central Safety Equip. Co.
Fisher Scientific Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Haws Drinking Faucet Co.
Industrial Products Co.
Karel First Aid Supply Co.
McDonald, B. F., Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equip. Co.
Speakman Co.

Signals, Highway Warning

Charleston Rubber Co.
Da-Nite Safety Industries
Davis Emergency Equip. Co., Inc.
Emarco Corp.
Falcon Alarm Co., Inc.
McDonald, B. F., Co.
Ready Made Sign Company, Inc.
Safety Clothing & Equip. Co.
Vari-Products Co

Signs, Accident Prevention

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brady, W. H., Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Canisteo Sign & Mfg. Co., Inc.
Central Safety Equip. Co.
Charleston Rubber Co.
Davenport, A. C., & Son, Inc.
Eastern Metal of Elmira, Inc.
Electric Cord Co.
Embossograph Corp. of America
General Scientific Equip. Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Matthews, Jas. H., & Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Moore Signs, Inc.
New Jersey Safety Equipment Co.
Overton, R. B., Co.
Prairie State Products Co.
Pulmosan Safety Equipment Corp.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sargent-Sowell, Inc.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Standard Signs, Inc.
Stonehouse Signs, Inc.
Vari-Products Co.
Wagner Sign Service, Inc.

Signs, Reflecting

American Allsafe Co., Inc.
Boyer-Campbell Co.
Brady, W. H., Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Canisteo Sign & Mfg. Co., Inc.
Eastern Metal of Elmira, Inc.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Products Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Prairie State Products Co.
Ready Made Sign Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sargent-Sowell, Inc.
Searjeant Metal Products, Inc.
Standard Safety Equipment Co.
Standard Signs, Inc.
Stonehouse Signs, Inc.
Vari-Products Co.

Sirens and Signals

Bomgardner Mfg. Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Gamewell Co.
Genter, C. D., Co.
Sterling Siren Fire Alarm Co., Inc.
Vari-Products Co.

Skull Caps

Associated Bag & Apron Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Davis Emergency Equip. Co., Inc.
Eastern Safety Equip. Co.
Fibre-Metal Products Co.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Gloves Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Safety Clothing & Equip. Co.
Scientific Industrial Supply Co., Inc.

Sleeves, Linemen's Rubber

Advance Glove Mfg. Co.
Boyer-Campbell Co., The
Central Safety Equipment Co.
Charleston Rubber Co.
Eastern Safety Equip. Co.
General Scientific Equip. Co.
Industrial Products Co.
McDonald, B. F., Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equip. Corp.
Safety Clothing & Equip. Co.
Saltsbury, W. H., & Co.
Scientific Industrial Supply Co., Inc.

Sleeves, Protective

Advance Glove Mfg. Co.
Allied Mfg. Co.
Aljay Mfg. Co.
American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Charleston Rubber Co.
Chicago Eye Shield Co.
Eastern Safety Equip. Co.
Erell Mfg. Co.
Fibre-Metal Products Co., The
Fisher Scientific Co.
Frommelt Industries
General Scientific Equip. Co.
Genter, C. D., Co.
Goodyear Industrial Products Co., Inc.
Halperin, A. E., Co., Inc.
Holcomb Safety Garment Co.
Industrial Gloves Co.
Industrial Products Co.
Jomac, Inc.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Milburn Co.
Miller Products Co., Inc.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Olympic Glove Co., Inc.
Plasco Safety Products Co.
Pulmosan Safety Equipment Corp.
Racine Glove Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sawyer Safety Products Co.
Scientific Industrial Supply Co., Inc.
Searjeant Metal Products, Inc.
Standard Glove Co.
Standard Safety Equipment Co.
Tower, A. J., Co.
Wheeler Protective Apparel, Inc.
Worklon, Inc.

Slings, Chain

American Chain & Cable Co.
Boyer-Campbell Co., The
Columbus-McKinnon Chain Corp.
Genter, C. D., Co.
Kenston Mfg. Co., Inc.
Taylor, S. G., Chain Co.

Sling Protectors

Newman Mfg. & Sales Co.
Union Wire Rope Corp.

Slings, Wire Rope

American Chain & Cable Co.
Bethlehem Steel Co.
Broderick & Bascom Rope Co.
Buhrke, R. H., Co.
Genter, C. D., Co.
Jones & Laughlin Steel Corp.
Kenston Mfg. Co., Inc.
Lowery Bros., Inc.
Macwhyte Co.
Union Wire Rope Corp.
Wickwire-Spencer Steel Div., Colorado Fuel & Iron Co.
Wire Rope Corp. of America, Inc.

Slit Tapes

Chart-Pak, Inc.

Smoker's Stand

Davenport, A. C., and Son, Inc.
Karel First Aid Supply Co.
New Jersey Safety Equipment Co.
Protectoseal Co.
Safety Clothing & Equip. Co.
Searjeant Metal Products, Inc.
Standard Industrial Products Co.

Soaps or Cleaners, Hand

Armour & Co.
Associated Just Distrs., Inc.
Banite Co.
Boyer-Campbell Co.
Breck, John H., Inc.
Brenton Equip. Co.
Brossard, Lester L., Co.
Brulin & Co., Inc.
Chemical Corp., The
Dameron Enterprises, Inc.
Dolge, C. B., Co.
Finnell Systems Inc.
Fuld Bros., Inc.
Halperin, A. E., Co., Inc.
Hillyard Chemical Co.
Hollingshead, R. M., Corp.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Kelite Corp.
Kennedy-Ingalls, V. E., Co.
Lightfoot-Schultz Co.
Magnus Chemical Co., Inc.
Midland Laboratories
Milburn Co.
Mine Safety Appliances Co.
Mione Mfg. Co.
Monsanto Chemical Co.
National Disinfectant Co.
Packwood, G. H., Mfg. Co.
Procter & Gamble Co.
Quickee Products, Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Sindar Corp.
Speedi-Dry Corp.
Stepan Chemical Co.
Sugar Beet Products Co.
Turco Products, Inc.
Vestal, Inc.
West Disinfecting Co.
Wrisley, Allen B., Co.

Soap Dispensers

Associated Just Distributors, Inc.
Banite Co.
Brulin & Co., Inc.
Chemical Corp.
Dameron Enterprises, Inc.
Dolge, C. B., Co.
Finnell System, Inc.
Halperin, A. E., Co., Inc.
Hillyard Chemical Co.

To locate Advertisements, see Advertisers' Index.

Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Kelite Corp.
Lightfoot-Schultz Co.
Midland Laboratories
Milburn Co.
National Disinfectant Co.
New Jersey Safety Equip. Co.
Packwood, G. H., Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Vestal, Inc.
Wrisley, Allen B., Co.

Soles, Shoe, Non-Slip

American Biltrite Rubber Co.
Bearfoot Sole Co., Inc.
Cambridge Rubber Co.
DuPont, E. I., deNemours & Co., Inc.
Eagle-Picher Co.
Emerson, J. H., Co.
Gro-Cord Rubber Co.
National Disinfectant Co.
Quabaug Rubber Co.

Solvents, Cleaning

Associated Just Distributors, Inc.
Brulin & Co., Inc.
Curran Corp.
Diversey Corp.
Dow Chemical Co.
DuPont, E. I., de Nemours & Co., Inc.
Fine Organics, Inc.
Finnell Systems, Inc.
Fisher Scientific Co.
Flamort Chemical Co.
Hollingshead, R. M., Corp.
Huntington Laboratories, Inc.
Karel First Aid Supply Co.
Kelite Corp.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
Moore, John B., Corp.
National Disinfectant Co.
Penetone Co.
Pittsburgh Plate Glass Co.
Practical Mfg. Co.
Tect, Inc.
Turco Products, Inc.
Wyandotte Chemicals Corp.

Sound Absorbers

Allied Wiltan Co., Inc.
Beltone Hearing Aid Co.
Boyer-Campbell Co., The
Hansson, Etof, Inc.
Industrial Acoustics Co., Inc.
Industrial Sound Control, Inc.
Kopper Co., Inc.
Metal Products Div.
Mitchell Rubber Products Inc.

Sound Analyzers

General Radio Corp.
McDonald, B. F., Co.
Mine Safety Appliances Co.
Scott, Herman Hosmer, Inc.

Sound Protectors

Allied Wiltan Co., Inc.
American Optical Co.
Boyer-Campbell Co., The
Industrial Products Co.
Koppers Co., Inc.,
Metal Products Div.
Maico Co., Inc.
McDonald, B. F., Co.
Mine Safety Appliances Co.
TransWall Coated Products,
Bemis Bro. Bag Co.

Spectacles, Industrial

American Optical Co.
Bausch & Lomb Optical Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Chicago Eye Shield Co.
Dockson Corp.
Fendall Co.
Fibre-Metal Products Co.
General Scientific Equip. Co.
Industrial Products Co.
Kennedy-Ingalls, V. E., Co.
Kimball Safety Products
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Seco Safety Products Co.
Sellstrom Mfg. Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Welsh Mfg. Co.
Willson Products, Inc.

Splints, Emergency

Orthopodic Frame Co.

Sprinkler Systems

"Automatic" Sprinkler Corp.
of America
Blaw-Knox Co.
Central Safety Equip. Co.
Grinnell Co., Inc.
Notifier Corp.
Rockwood Sprinkler Co.

Stain Remover, Floor

Associated Just Distrs., Inc.
Fuld Bros., Inc.
Huntington Laboratories, Inc.
Kelite Corp.
Magnus Chemical Co., Inc.
Pittsburgh Plate Glass Co.

Stair Treads, Safety

Alan Wood Steel Co.
American Abrasive Metals Co.
American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brabrook, A. N., Inc.
Bustin Steel Products, Inc.
Globe Co., Grip-Strut Div.
Hallemite Mfg. Co., The
Huntington Laboratories, Inc.
Industrial Products Co.
Kleinp Metal Grating Corp.
New York Belting & Packing Co.
Reliance Steel Products Co.
Safety Clothing & Equip. Co.
Searjeant Metal Products, Inc.
Superior Rubber Mfg. Co.

Stairways

American Abrasive Metals Co.
Bil-Jax, Inc.
Bustin Steel Products, Inc.
Globe Co., Grip-Strut Div.
Woodbridge Ornament Iron Co.

Stamps, Steel Marking

Cunningham, M. E., Co.
Matthews, James H., Co.

Standards and Signs, Accident Prevention, Portable

American Allsafe Co., Inc.
Boyer-Campbell Co., The
Brenton Equip. Co.
Canisteo Sign & Mfg. Co., Inc.
Charleston Rubber Co.
Davenport, A. C., and Son, Inc.
Eastern Metal of Elmira, Inc.
Industrial Products Co.
McDonald, B. F., Co.
Moore Signs, Inc.
New Jersey Safety Equipment Co.
Overton, R. B., Co.
(Mfrs. Elkay Safety Signals)
Prairie State Products Co.
Pulmosan Safety Equipment Corp.
Ready Made Sign Co., Inc.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Standard Safety Equipment Co.
Standard Signs, Inc.
Stonehouse Signs, Inc.
Vari-Products Co.

Static Ground Device, Personnel

Browne, Stewart R., Mfg. Co., Inc.
Conductive Hospital Accessories Corp.
Gilbert-Barker Co.
Legge, Walter G., Co., Inc.

Static Ground Device, Reel

Ericson Mfg. Co., The

Steel Toes, Safety Shoes

General Scientific Equip. Co.
Hy-Test Safety Shoes Division
Mine Safety Appliances Co.
Reece Wooden Sole Shoe Co.
Safety Box Toe Co.

Steering Aid, Shock-Proof

Kosch Mfg. Co.

Sterilizing Equipment

Alos, A. S., Co.
Fisher Scientific Co.
Halperin, A. E., Co., Inc.
Karel First Aid Supply Co.
Safety First Supply Co.
Vacuum Can Co.

Stirrups, Mechanical

Albina Machine & Engine Works, Inc.
Bil-Jax, Inc.
Smith, D. B., & Co., Inc.

Stools, Insulating

Hallsbury, W. H., & Co.

Straps, Safety

Boyer-Campbell Co., The
Brenton Equip. Co.
Buhrke, R. H., Co.
Davis Emergency Equipment Co., Inc.
General Scientific Equip. Co.
Genter, C. D., Co.
Industrial Products Co.
Industrial Safety Belt Co.
Klein, Mathias, & Sons
McDonald, B. F., Co.
Miller Equip. Co., Inc.
Mine Safety Appliances Co.
Pulmosan Safety Equipment Corp.
Rose Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.

Stretchers

American Allsafe Co., Inc.
Bomgardner Mfg. Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equipment Co.
Davis Emergency Equip. Co., Inc.
Frank Mfg. Co., Inc.
Genter, C. D., Co.,
Halperin, A. E., Co., Inc.
Industrial Products Co.
Junkin Safety Appliances Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medford Mfg. Co.
Medical Supply Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Saroie, Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Glove Co.
Standard Safety Equipment Co.
Washington Products Co.

Stretcher Kits and Cases

American Allsafe Co., Inc.
Bomgardner Mfg. Co.
Boyer-Campbell Co., The
Brenton Equip. Co.
Bullard, E. D., Co.
Central Safety Equip. Co.
Davis Emergency Equip. Co., Inc.
Genter, C. D., Co.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Junkin Safety Appliances Co., Inc.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Medford Mfg. Co.
Medical Supply Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Safety Clothing & Equip. Co.
Saroie, Inc.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Standard Safety Equipment Co.
Washington Products Co.

Structural Components

Chart-Pak, Inc.

Sun Glasses

American Optical Co.
Armorlite Lens Co., Inc.
Bausch & Lomb Optical Co.
Dockson Corp.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Halperin, A. E., Co., Inc.
Kennedy-Ingalls, V. E., Co.
Mitchell Mfg. Co.
Safety Clothing & Equipment Co.
U. S. Safety Service Co.
Wallace Optical Co., Inc.
Watchemoket Optical Co.
Willson Products, Inc.

Sweat Bands

American Allsafe Co., Inc.
American Optical Co.
Boyer-Campbell Co.
Brenton Equip. Co.
Brossard, Lester L., Co.
Bullard, E. D., Co.
Central Safety Equip. Co.
Davis Emergency Equip. Co., Inc.
Dockson Corp.
Fibre-Metal Products Co.
General Bandages, Inc.
General Scientific Equip. Co.
Genter, C. D., Co.
Glendale Optical Co., Inc.
Halperin, A. E., Co., Inc.
Industrial Products Co.
Karel First Aid Supply Co.
Kennedy-Ingalls, V. E., Co.
McDonald, B. F., Co.
Mine Safety Appliances Co.
New Jersey Safety Equipment Co.
Pulmosan Safety Equipment Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Searjeant Metal Products, Inc.
Seco Safety Products Co.
Sellstrom Mfg. Co.
Standard Glove Co.
Standard Safety Equipment Co.
Wallace Optical Co., Inc.
Willson Products, Inc.

Sweepers

Cesco

Sweepers, for Roads, Parking Lots

Handling Devices Co., Inc.
M-B Corp.
New Jersey Safety Equipment Co.

Sweepers, for Roads, Parking Lots, Magnetic

Multifinish Mfg. Co.

See directory of Safety Equipment Sources for addresses.

Sweeping Compounds
Associated Just Distributors, Inc.
Canfield Oil Co.
Cottentex Products Co.
Dameron Enterprises, Inc.
Genter, C. D., Co.
Hillyard Chemical Co.
Huntington Laboratories, Inc.
Legge, Walter G., Co., Inc.
Magnus Chemical Co., Inc.
National Disinfectant Co.
Scientific Industrial Supply Co., Inc.

Swing Stage
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Swivels
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Symbols, Adhesive Backing
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Want More Information?

. . . the Reader Service postcard will get it for you FAST!

Here's how it works—

Printed below are two identical Reader Service postcards — the bottom one for your use; the top one for later readers of this issue. The numbers listed on each card are keyed to products advertised. Just circle the items you want to know more about, and we will ask the manufacturer to send you full information without obligation. Both cards are perforated for easy removal and no postage is required.

Products Advertised

As you read through this issue of the NEWS, you will find advertisements describing equipment that may help you solve some of your accident problems. Instead of making a "mental note," make sure you get full information by circling the corresponding page number on the Reader Service postcard. The letters L, R, T and B locate the ads on the page—left, right, top and bottom. IFC —inside front cover; IBC—inside back cover; BC—back cover.

IMPORTANT—Be sure to fill in your name, organization and address in the space provided on this side of the postcard.

Please send me more information on the items circled below: **MARCH 1957**

PRODUCTS ADVERTISED:

IFC	16	21	22L	22R	23	24L	24R	25	26T	26B	27	28	30	33
37	39	40	41	42	43LT	43LB	43R	44L	44R	45	46T	46B	47	48L
48R	49L	49R	50T	50B	51	52T	52B	54	59	60	61	62	63	64T
64B	65	66	67	68	69	70T	70B	71	72T	72B	73	74T	74B	75
76L	76RT	76RB	78	83	84	86	87	88T	88B	89	90T	90B	94	
96	97	99	100	102	103	104	105	107	109	111	113	114	115	116
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131	132L	132R	133L	133R	134	135T	135B	136T	136B	141	142	143	145	146
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168B	169	170	171	172T	172B	173	174	175	176L	176R	177	178T	178B	179T
179B	180T	180B	181T	181B	182T	182B	183LB	183RT	183RB	184T	184B	185T	185B	186LT
186LB	186RB	191	192	195	197	198	199	200	201	202T	202B	203	204T	204B
206	206L	206R	211	213	215	217	219	220T	220B	221T	221B	222L	222R	223L
223R	224T	224B	225L	225R	226LT	226LB	226RT	226RB	231	233	234	235	237	238
239	241	242	243	245	246	247	248L	248R	249	250	251	252T	252B	253T
253B	254LT	254LB	254RB	259	260	261	262	263	264T	264B	265L	265R	266T	266B
271	273	274	276	278	283	284T	284B	285T	285B	286	287	288	IBC	BC

Please print your name and company in full—do not abbreviate

NAME.....

POSITION.....

COMPANY.....

ADDRESS.....

CITY & STATE.....

Please send me more information on the items circled below: **MARCH 1957**

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64B	65	66	67	68	69	70T	70B	71	72T	72B	73	74T	74B	75
76L	76RT	76RB	78	83	84	86	87	88T	88B	89	90T	90B	94	
96	97	99	100	102	103	104	105	107	109	111	113	114	115	116
117	118T	118B	119	120	121	122	123	124	125	126	127	128	129	130T
131	132L	132R	133L	133R	134	135T	135B	136T	136B	141	142	143	145	146
148	149	151	153	154	155	157	159	161	163	164	165	166	167	168T
168B	169	170	171	172T	172B	173	174	175	176L	176R	177	178T	178B	179T
179B	180T	180B	181T	181B	182T	182B	183LB	183RT	183RB	184T	184B	185T	185B	186LT
186LB	186RB	191	192	195	197	198	199	200	201	202T	202B	203	204T	204B
206	206L	206R	211	213	215	217	219	220T	220B	221T	221B	222L	222R	223L
223R	224T	224B	225L	225R	226LT	226LB	226RT	226RB	231	233	234	235	237	238
239	241	242	243	245	246	247	248L	248R	249	250	251	252T	252B	253T
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NAME.....

POSITION.....

COMPANY.....

ADDRESS.....

CITY & STATE.....

The advertising pages of the News

. . . your guide to reliable suppliers of worthwhile safety equipment

The advertising policy of the NEWS requires that all **equipment** and products meet established codes and **standards, have the** approval of recognized testing agencies, **or have** proven their value through actual use in **industry. Council** engineers and technicians screen every advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

FIRST CLASS
PERMIT No. 834
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NATIONAL SAFETY NEWS

425 NORTH MICHIGAN AVENUE

CHICAGO 11, ILLINOIS

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Reader Service Department

NATIONAL SAFETY NEWS

425 NORTH MICHIGAN AVENUE

CHICAGO 11, ILLINOIS

Before you mail your Reader Service postcard . . . TAKE ANOTHER LOOK at the ADVERTISING PAGES

Make sure all the items you want to know more about are circled . . . check to make sure your name, organization, and address are printed on the reverse side of the postcard . . . THEN mail it today.

National Safety News, March, 1957

CESCO...RIGHT—BEFORE YOUR EYES!

New No. 565
flexible plastic goggles

New fiber-glass
face shield

Cup-type goggles

Fiber-
glass
helmet

No. 255
LITE-KLIPS

Approved
respirators

No. 305
LITE-SPEC

Approved
respirator
hoods

Spectacle-type
goggles

New CESCO
plastic frame
safety glasses

It Pays to Buy Safety Equipment from a Safety Specialist

• CESCO distributors are experienced safety specialists. They know how to work with safety directors, personnel directors and plant management to help in the choice of the finest safety equipment available. They are well stocked with equipment that has stood the test of time in industrial plants everywhere.

Buy with confidence
—Buy from
CESCO
Distributors

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Guardian Safety Equipment Co.
427½ Moreland Avenue, N. E.

BATON ROUGE, LA.
Guardian Safety Equipment Co.
3615 Capitol Heights Ave.

BIRMINGHAM, ALA.
"L. P." Harless Company
2627 Seventh Avenue, South

BOSTON, MASS.
General Equipment Corporation
261 Franklin Street

BUFFALO, N. Y.
The Watson Company
1443 Main Street

CHICAGO, ILL.
Universal Safety Equipment Co.
5115 Diversey

CINCINNATI, OHIO
Williams & Co., Inc.
3231 Fredonia Avenue

CLEVELAND, OHIO
Williams & Co., Inc.
3700 Perkins Avenue

COLUMBUS, OHIO
Williams & Co., Inc.
851 Williams Avenue

DALLAS, TEXAS
Guardian Safety Equipment Co.
900 Jefferson Tower Bldg.

DENVER, COLORADO
General Welding Supply Co.
1434 Blake Street

DETROIT, MICH.
Averill Equipment Company
19225 Conant Avenue

HOUSTON, TEXAS
Guardian Safety Equipment Co.
1915 Westheimer

KANSAS CITY, MO.
Safety, Incorporated
17 E. 31st Street

KNOXVILLE, TENN.
Safety Equipment Distributing Co.
832 W. Main Avenue

LOS ANGELES, CALIF.
Guardian Safety Equipment Co.
7223 S. Main Street

LOUISVILLE, KENTUCKY
Williams & Co., Inc.
3109 S. Preston Street

MILWAUKEE, WIS.
Universal Safety Equipment Co.
3155 S. 7th Street

NEW YORK, N. Y.
(See ORANGE, N. J.)

ORANGE, N. J.
Guardian Safety Equipment Co.
400 S. Jefferson Street
(New York-New Jersey Area)

PEORIA, ILL.
Standard Industrial Products Co.
920 N. Garfield

PHILADELPHIA, PA.
Guardian Safety Equipment Co.
214 S. 45th Street

PITTSBURGH, PA.
Williams & Co., Inc.
901 Pennsylvania Avenue

ST. LOUIS, MO.
Safety, Inc.
2608 Olive Street

ST. PAUL, MINN.
Continental Safety Equipment, Inc.
1551 Selby Ave.

SALT LAKE CITY, UTAH
Universal Fire & Safety
Equipment Co., Box 1587

SAN MATEO, CALIF.
Guardian Safety Equipment Co.
220 Third Avenue

SPOKANE, WASH.
Spokane Safety Appliance Co.
North 219 Division Street

TOLEDO, OHIO
Williams & Co., Inc.
946 Kane Street

TULSA, OKLA.
Guardian Safety Equipment Co.
1742 S. Main Street

MEXICO CITY, D. F.
Safety Equipment S. A.
Sullivan 95

MONTREAL, CANADA
The Butler Optical Company, Ltd.
1520 Mountain Street

CHICAGO EYE SHIELD COMPANY
2306 Warren Boulevard
Chicago 12, Illinois

CESCO C E S C O **FOR SAFETY**

Respiratory Protection

Two AO† Best Buys in Respirators for Paint Spraying!

- Exceptionally Long Filter Life
- Extremely High Efficiency

For complete security and the finest respiratory protection against paint sprays and vapors you need only the AO R-5051 Respirator *plus AO R-65 auxiliary filters* which prevent droplets of paint from plugging the chemical cartridges. R-65 filters are packaged 200 per box and two R-66 auxiliary filter clamps are provided with each box of auxiliary filters. The R-5051 is approved by the U. S. Bureau of Mines for use against organic vapors. (Approval No. BM-2304.)

The single cartridge AO R-2031 Respirator is light in weight for comfort, highly efficient . . . and engineered for long life. For this quality protection in paint spraying merely order the R-2031 Respirator *plus AO R-7 auxiliary filters*. These auxiliary filters prevent paint droplets from plugging the chemical cartridge. R-7 filters are packaged 100 per box and are easily attached or removed from the respirator.

Your nearest AO Safety Products Representative can supply you with the face piece and components to meet your special needs. Check with him also for AO safety glasses and protective clothing.

Always insist on the AO trademark on lenses and frames

American Optical COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES